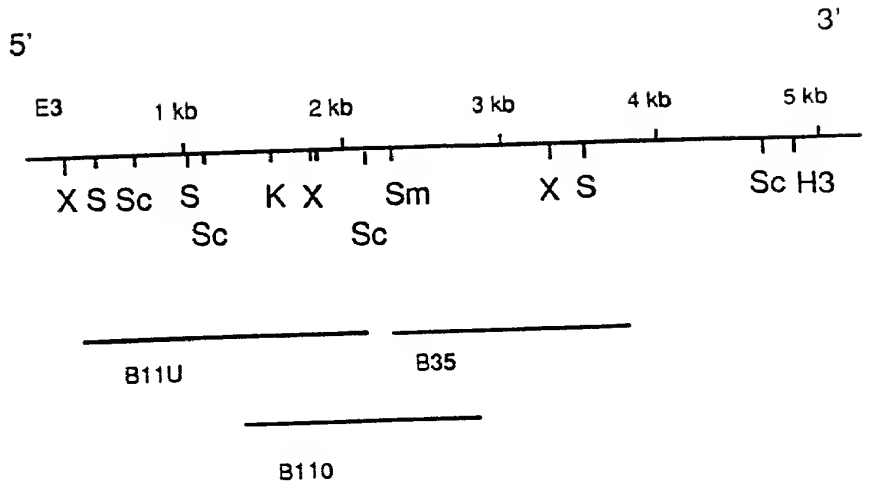
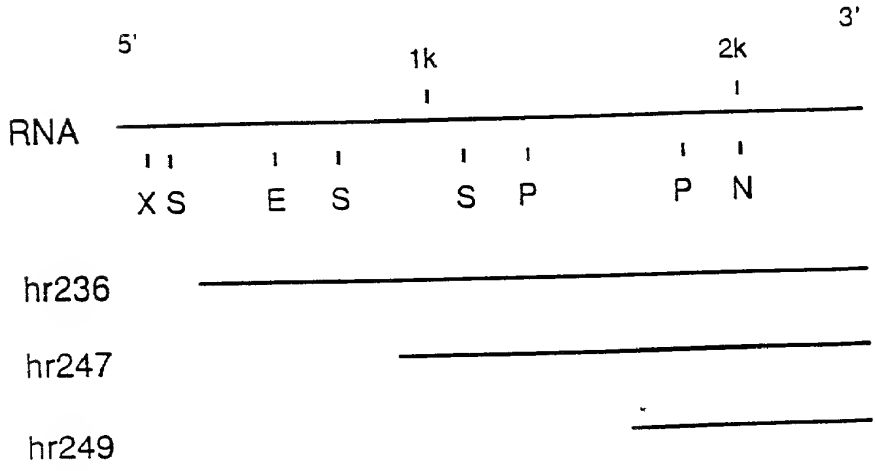
Map of HaSV RNA 1 clones



H3=Hind3, K=Kpn1, Sc=Sac1, S=Sal1, Sm=Sma1, X=Xho1

FIG. 1a

Map of HaSV RNA 2 clones



E=EcoR1, N=Not1, P=Pst1, S=Sal1. X=Xho1

FIG. 1b

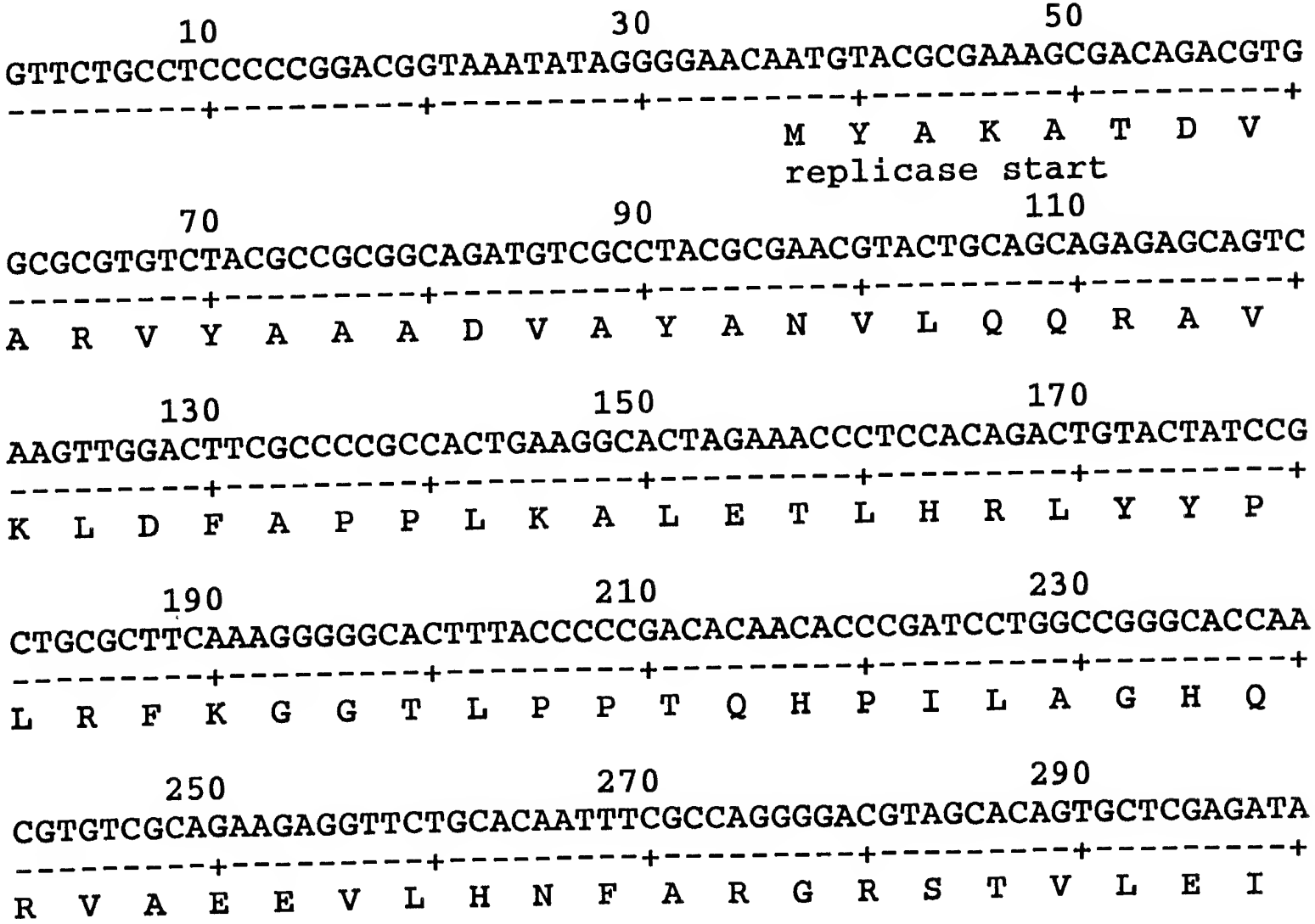


FIG. 2

FIG. 2 Cont'd

```
        610                           630                           650
GAGAACCACGGACTTCACATGGTCCGCGCGTTCATGCACATGCCAGAAGAGCTGCTCTAC
---------+---------+---------+---------+---------+---------+
E  N  H  G  L  H  M  V  R  A  F  M  H  M  P  E  E  L  L  Y

        670                           690                           710
ATGGACAACGTGGTTAATGCCGAGCTCGGCTACCGCTTCCACGTTATTGAAGAGCCTATG
---------+---------+---------+---------+---------+---------+
M  D  N  V  V  N  A  E  L  G  Y  R  F  H  V  I  E  E  P  M

        730                           750                           770
GCTGTGAAGGACTGCGCATTCCAGGGGGGGGACCTCCGTCTCCACTTCCCTGAGTTGGAC
---------+---------+---------+---------+---------+---------+
A  V  K  D  C  A  F  Q  G  G  D  L  R  L  H  F  P  E  L  D

        790                           810                           830
TTCATCAACGAGAGCCAAGAGCGGCGCATCGAGAGGCTGGCCGCCCGCGGCTCCTACTCC
---------+---------+---------+---------+---------+---------+
F  I  N  E  S  Q  E  R  R  I  E  R  L  A  A  R  G  S  Y  S

        850                           870                           890
AGACGCGCCGTCATTTTCTCCGGCGACGACGACTGGGGTGATGCGTACTTACACGACTTC
---------+---------+---------+---------+---------+---------+
R  R  A  V  I  F  S  G  D  D  D  W  G  D  A  Y  L  H  D  F
```

FIG. 2 Cont'd

```
          910                 930                 950
CACACATGGCTCGCCTACCTACTGGTGAGGAACTACCCCACTCCGTTTGGTTTCTCACTC
---------+---------+---------+---------+---------+---------+
H  T  W  L  A  Y  L  L  V  R  N  Y  P  T  P  F  G  F  S  L

          970                 990                1010
CATATAGAAGTCCAGAGGCGCCACGGCTCCAGCATTGAGCTGCGCATCACTCGCGCGCCA
---------+---------+---------+---------+---------+---------+
H  I  E  V  Q  R  R  H  G  S  S  I  E  L  R  I  T  R  A  P

         1030                1050                1070
CCTGGAGACCGCATGCTGGCCGTCGTCCCAAGGACGTCCCAAGGCCTCTGCAGAATCCCA
---------+---------+---------+---------+---------+---------+
P  G  D  R  M  L  A  V  V  P  R  T  S  Q  G  L  C  R  I  P

         1090                1110                1130
AACATCTTTTATTACGCCGACGCGTCGGGCACTGAGCATAAGACCATCCTTACGTCACAG
---------+---------+---------+---------+---------+---------+
N  I  F  Y  Y  A  D  A  S  G  T  E  H  K  T  I  L  T  S  Q

         1150                1170                1190
CACAAAGTCAACATGCTGCTCAATTTTATGCAAACGCGTCCTGAGAAGGAACTAGTCGAC
---------+---------+---------+---------+---------+---------+
H  K  V  N  M  L  L  N  F  M  Q  T  R  P  E  K  E  L  V  D
```

FIG. 2 Cont'd

```
          1210                1230                1250
ATGACCGTCTTGATGTCGTTCGCGCGCTAGGCTGCGCGATCGTGGTCGCCTCAGAA
---------+---------+---------+---------+---------+---------+
M  T  V  L  M  S  F  A  R  A  R  L  R  A  I  V  V  A  S  E

          1270                1290                1310
GTCACCGAGAGCTCCTGGAACATCTCACCGGCTGACCTGGTCCGCACTGTCGTGTCTCTT
---------+---------+---------+---------+---------+---------+
V  T  E  S  S  W  N  I  S  P  A  D  L  V  R  T  V  V  S  L

          1330                1350                1370
TACGTCCTCCACATCATCGAGCGCCGAAGGGCTGCGGTCGCTGTCAAGACCGCCAAGGAC
---------+---------+---------+---------+---------+---------+
Y  V  L  H  I  I  E  R  R  R  A  A  V  A  V  K  T  A  K  D

          1390                1410                1430
GACGTCTTTGGAGAGACTTCGTTCTGGGAGAGTCTCAAGCACGTCTTGGGCTCCTGTTGC
---------+---------+---------+---------+---------+---------+
D  V  F  G  E  T  S  F  W  E  S  L  K  H  V  L  G  S  C  C

          1450                1470                1490
GGTCTGCGCAACCTCAAAGGCACCGACGTCGTCTTTACTAAGCGCGTCGTCGATAAGTAC
---------+---------+---------+---------+---------+---------+
G  L  R  N  L  K  G  T  D  V  V  F  T  K  R  V  V  D  K  Y
```

FIG. 2 Cont'd

```
          1510                      1530                      1550
CGAGTCCACTCGCTCGGAGACATAATCTGCGACGTCCGCCTGTCCCCTGAACAGGTCGGC
---------+---------+---------+---------+---------+---------+
R  V  H  S  L  G  D  I  I  C  D  V  R  L  S  P  E  Q  V  G

          1570                      1590                      1610
TTCCTGCCGTCCCGCGTACCACCTGCCCGCGTCTTTCACGACAGGGAAGAGCTTGAGGTC
---------+---------+---------+---------+---------+---------+
F  L  P  S  R  V  P  P  A  R  V  F  H  D  R  E  E  L  E  V

          1630                      1650                      1670
CTTCGCGAAGCTGGCTGCTACAACGAACGTCCGGTACCTTCCACTCCTCCTGTGGAGGAG
---------+---------+---------+---------+---------+---------+
L  R  E  A  G  C  Y  N  E  R  P  V  P  S  T  P  P  V  E  E

          1690                      1710                      1730
CCCCAAGGTTTCGACGCCGACTTGTGGCACGCGACCGCGGCCTCACTCCCCGAGTACCGC
---------+---------+---------+---------+---------+---------+
P  Q  G  F  D  A  D  L  W  H  A  T  A  A  S  L  P  E  Y  R

          1750                      1770                      1790
GCCACCTTGCAGGCAGGTCTCAACACCGACGTCAAGCAGCTCAAGATCACCCTCGAGAAC
---------+---------+---------+---------+---------+---------+
A  T  L  Q  A  G  L  N  T  D  V  K  Q  L  K  I  T  L  E  N
```

FIG. 2 Cont'd

```
        1810                  1830                  1850
GCCCTCAAGACCATCGACGGGCTCACCCTCTCCCCAGTCAGAGGCCTCGAGATGTACGAG
---------+---------+---------+---------+---------+---------+
A  L  K  T  I  D  G  L  T  L  S  P  V  R  G  L  E  M  Y  E

        1870                  1890                  1910
GGCCCGCCAGGCAGCGGCAAGACGGGCACCCTCATCGCCGCCCTTGAGGCCGCGGGCGGT
---------+---------+---------+---------+---------+---------+
G  P  P  G  S  G  K  T  G  T  L  I  A  A  L  E  A  A  G  G

        1930                  1950                  1970
AAAGCACTTTACGTGGCACCCACCAGAGAACTGAGAGAGGCTATGGACCGGCGGATCAAA
---------+---------+---------+---------+---------+---------+
K  A  L  Y  V  A  P  T  R  E  L  R  E  A  M  D  R  R  I  K

        1990                  2010                  2030
CCGCCGTCCGCCTCGGCTACGCAACATGTCGCCCTTGCGATTCTCCGTCGTGCCACCGCC
---------+---------+---------+---------+---------+---------+
P  P  S  A  S  A  T  Q  H  V  A  L  A  I  L  R  R  A  T  A

        2050                  2070                  2090
GAGGGCGCCCCTTTCGCTACCGTGGTTATCGACGAGTGCTTCATGTTCCCGCTCGTGTAC
---------+---------+---------+---------+---------+---------+
E  G  A  P  F  A  T  V  V  I  D  E  C  F  M  F  P  L  V  Y
```

FIG. 2 Cont'd

```
        2110                2130                2150
GTCGCGATCGTGCACGCCTTGTCCCCGAGCTCACGAATAGTCCTTGTAGGGGACGTCCAC
---------+---------+---------+---------+---------+---------+
V  A  I  V  H  A  L  S  P  S  S  R  I  V  L  V  G  D  V  H

        2170                2190                2210
CAAATCGGGTTTATAGACTTCCAAGGCACAAGCGCGAACATGCCGCTCGTTCGCGACGTC
---------+---------+---------+---------+---------+---------+
Q  I  G  F  I  D  F  Q  G  T  S  A  N  M  P  L  V  R  D  V

        2230                2250                2270
GTTAAGCAGTGCCGTCGGCGCACTTTCAACCAAACCAAGCGCTGTCCGGCCGACGTCGTT
---------+---------+---------+---------+---------+---------+
V  K  Q  C  R  R  R  T  F  N  Q  T  K  R  C  P  A  D  V  V

        2290                2310                2330
GCCACCACGTTTTTCCAGAGCTTGTACCCCGGGTGCACAACCACCTCAGGGTGCGTCGCA
---------+---------+---------+---------+---------+---------+
A  T  T  F  F  Q  S  L  Y  P  G  C  T  T  T  S  G  C  V  A

        2350                2370                2390
TCCATCAGCCACGTCGCCCCAGACTACCGCAACAGCCAGGCGCAAACGCTCTGCTTCACG
---------+---------+---------+---------+---------+---------+
S  I  S  H  V  A  P  D  Y  R  N  S  Q  A  Q  T  L  C  F  T
```

FIG. 2 Cont'd

```
        2410                       2430                       2450
CAGGAGGAAAAGTCGCGCCACGGGGCTGAGGGCGCGATGACTGTGCACGAAGCGCAGGGA
---------+---------+---------+---------+---------+---------+
Q  E  E  K  S  R  H  G  A  E  G  A  M  T  V  H  E  A  Q  G

        2470                       2490                       2510
CGCACTTTTGCGTCTGTCATTCTGCATTACAACGGCTCCACAGCAGAGCAGAAGCTCCTC
---------+---------+---------+---------+---------+---------+
R  T  F  A  S  V  I  L  H  Y  N  G  S  T  A  E  Q  K  L  L

        2530                       2550                       2570
GCTGAGAAGTCGCACCTTCTAGTCGGCATCACGCGCCACACCAACCACCTGTACATCCGC
---------+---------+---------+---------+---------+---------+
A  E  K  S  H  L  L  V  G  I  T  R  H  T  N  H  L  Y  I  R

        2590                       2610                       2630
GACCCGACAGGTGACATTGAGAGACAACTCAACCATAGCGCGAAAGCCGAGGTGTTTACA
---------+---------+---------+---------+---------+---------+
D  P  T  G  D  I  E  R  Q  L  N  H  S  A  K  A  E  V  F  T

        2650                       2670                       2690
GACATCCCTGCACCCCTGGAGATCACGACTGTCAAACCGAGTGAAGAGGTGCAGCGCAAC
---------+---------+---------+---------+---------+---------+
D  I  P  A  P  L  E  I  T  T  V  K  P  S  E  E  V  Q  R  N
```

FIG. 2 Cont'd

```
        2710                2730                2750
GAAGTGATGGCAACGATACCCCCGCAGAGTGCCACGCCGCACGGAGCAATCCATCTGCTC
---------+---------+---------+---------+---------+---------+
E  V  M  A  T  I  P  P  Q  S  A  T  P  H  G  A  I  H  L  L

        2770                2790                2810
CGCAAGAACTTCGGGGACCAACCCGACTGTGGCTGTGTCGCTTTGGCGAAGACCGGCTAC
---------+---------+---------+---------+---------+---------+
R  K  N  F  G  D  Q  P  D  C  G  C  V  A  L  A  K  T  G  Y

        2830                2850                2870
GAGGTGTTTGGCGGTCGTGCCAAAATCAACGTAGAGCTTGCCGAACCCGACGCGACCCCG
---------+---------+---------+---------+---------+---------+
E  V  F  G  G  R  A  K  I  N  V  E  L  A  E  P  D  A  T  P

        2890                2910                2930
AAGCCGCATAGGGCGTTCCAGGAAGGGGTACAGTGGGTCAAGGTCACCAACGCGTCTAAC
---------+---------+---------+---------+---------+---------+
K  P  H  R  A  F  Q  E  G  V  Q  W  V  K  V  T  N  A  S  N

        2950                2970                2990
AAACACCAGGCGCTCCAGACGCTGTTGTCCCGCTACACCAAGCGAAGCGCTGACCTGCCG
---------+---------+---------+---------+---------+---------+
K  H  Q  A  L  Q  T  L  L  S  R  Y  T  K  R  S  A  D  L  P
```

FIG. 2 Cont'd

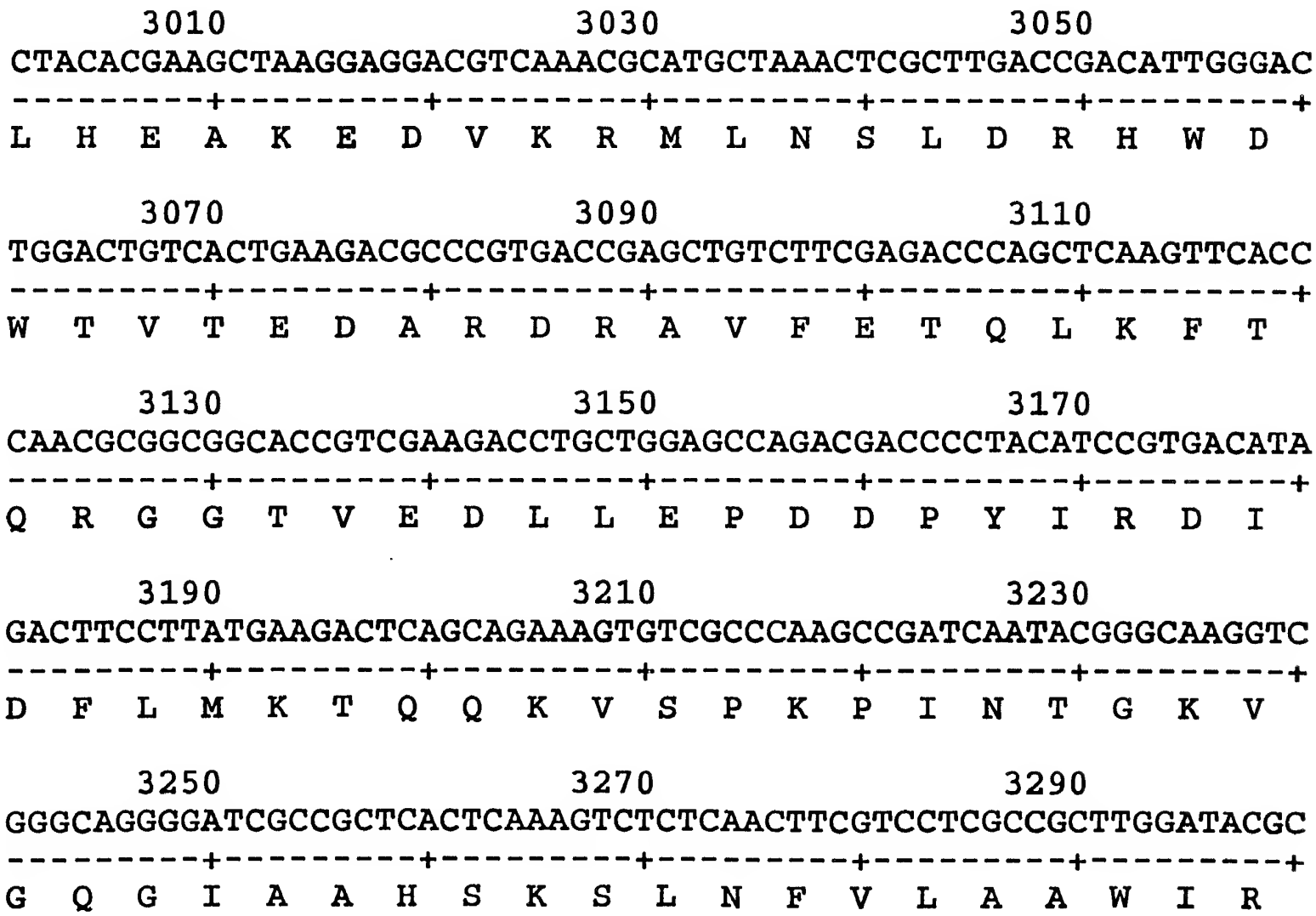


FIG. 2 Cont'd

```
          3310                3330                3350
ATACTCGAGGAGATACTCCGTACCGGGAGCCGCACGGTCCGGTACAGCAACGGTCTCCCC
---------+---------+---------+---------+---------+---------+
I  L  E  E  I  L  R  T  G  S  R  T  V  R  Y  S  N  G  L  P

          3370                3390                3410
GACGAAGAAGAGGCCATGCTGCTCGAAGCGAAGATCAATCAAGTCCCACACGCCACGTTC
---------+---------+---------+---------+---------+---------+
D  E  E  E  A  M  L  L  E  A  K  I  N  Q  V  P  H  A  T  F

          3430                3450                3470
GTCTCGGCGGACTGGACCGAGTTTGACACCGCCCACAATAACACGAGTGAGCTGCTCTTC
---------+---------+---------+---------+---------+---------+
V  S  A  D  W  T  E  F  D  T  A  H  N  N  T  S  E  L  L  F

          3490                3510                3530
GCCGCCCTTTTAGAGCGCATCGGCACGCCTGCAGCTGCCGTTAATCTATTCAGAGAACGG
---------+---------+---------+---------+---------+---------+
A  A  L  L  E  R  I  G  T  P  A  A  A  V  N  L  F  R  E  R

          3550                3570                3590
TGTGGGAAACGCACCTTGCGAGCGAAGGGTCTAGGCTCCGTTGAAGTCGACGGTCTGCTC
---------+---------+---------+---------+---------+---------+
C  G  K  R  T  L  R  A  K  G  L  G  S  V  E  V  D  G  L  L
```

FIG. 2 Cont'd

```
       3610                3630                3650
GACTCCGGCGCAGCTTGGACGCCTTGCCGCAACACCATCTTCTCTGCCGCCGTCATGCTC
---------+---------+---------+---------+---------+---------+
D  S  G  A  A  W  T  P  C  R  N  T  I  F  S  A  A  V  M  L

       3670                3690                3710
ACGCTCTTCCGCGGCGTCAAGTTCGCAGCTTTCAAAGGCGACGACTCGCTCCTCTGTGGT
---------+---------+---------+---------+---------+---------+
T  L  F  R  G  V  K  F  A  A  F  K  G  D  D  S  L  L  C  G

       3730                3750                3770
AGCCATTACCTCCGTTTCGACGCTAGCCGCCTTCACATGGGCGAACGTTACAAGACCAAA
---------+---------+---------+---------+---------+---------+
S  H  Y  L  R  F  D  A  S  R  L  H  M  G  E  R  Y  K  T  K

       3790                3810                3830
CATTTGAAGGTCGAGGTGCAGAAAATCGTGCCGTACATCGGACTCCTCGTCTCCGCTGAG
---------+---------+---------+---------+---------+---------+
H  L  K  V  E  V  Q  K  I  V  P  Y  I  G  L  L  V  S  A  E

       3850                3870                3890
CAGGTCGTCCTCGACCCTGTCAGGAGCGCTCTCAAGATATTTGGGCGCTGCTACACAAGC
---------+---------+---------+---------+---------+---------+
Q  V  V  L  D  P  V  R  S  A  L  K  I  F  G  R  C  Y  T  S
```

FIG. 2 Cont'd

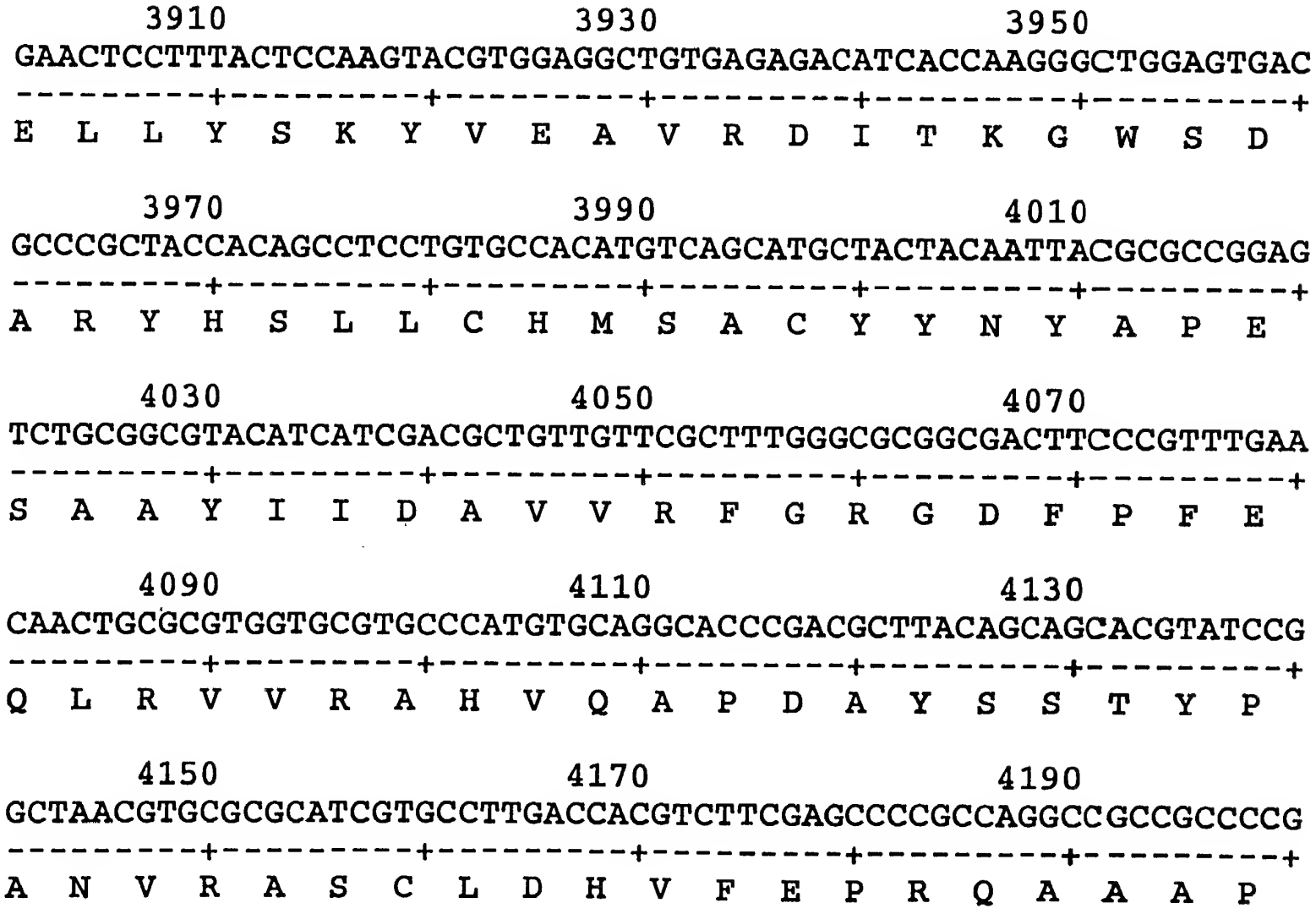


FIG. 2 Cont'd

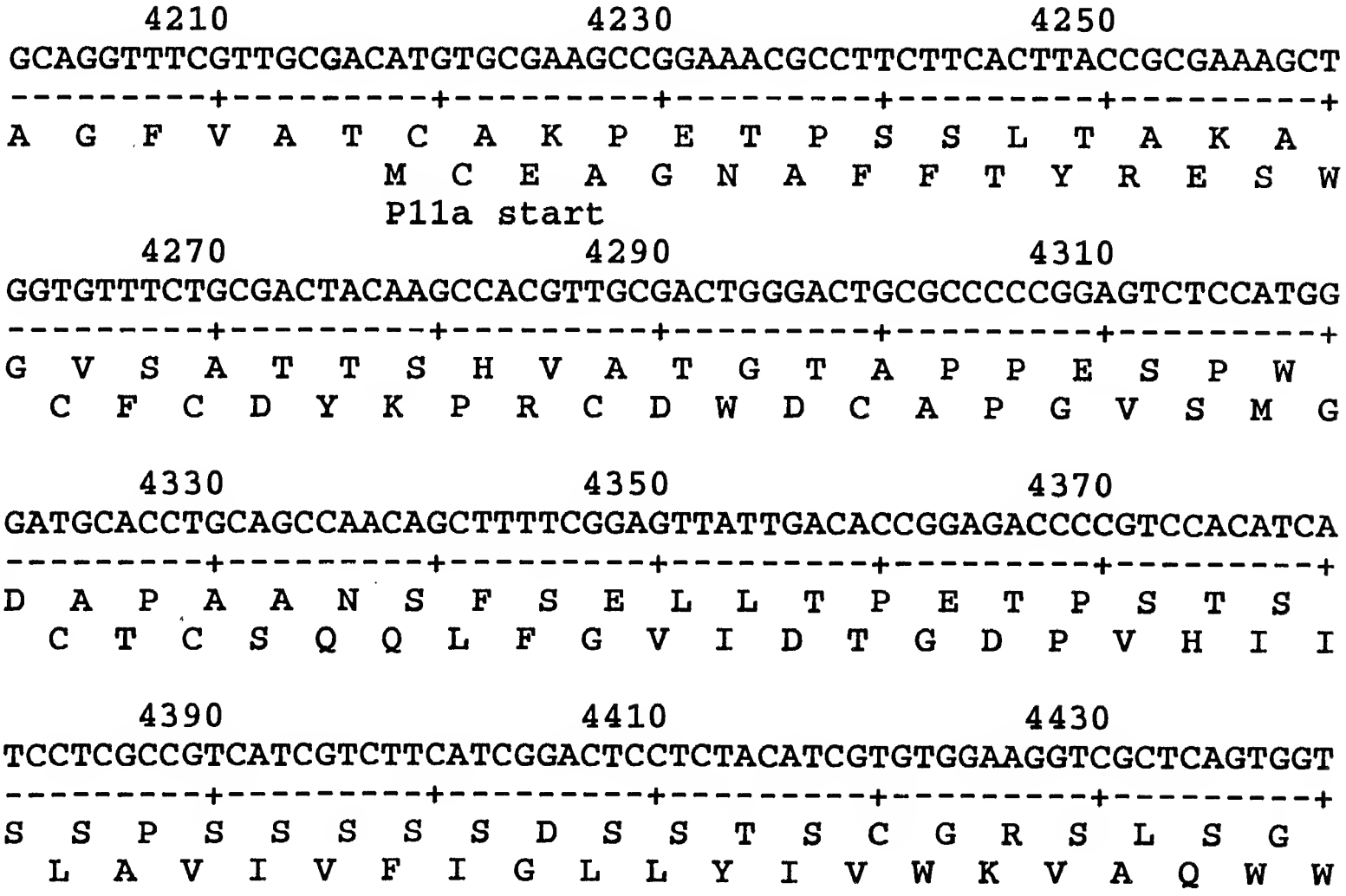


FIG. 2 Cont'd

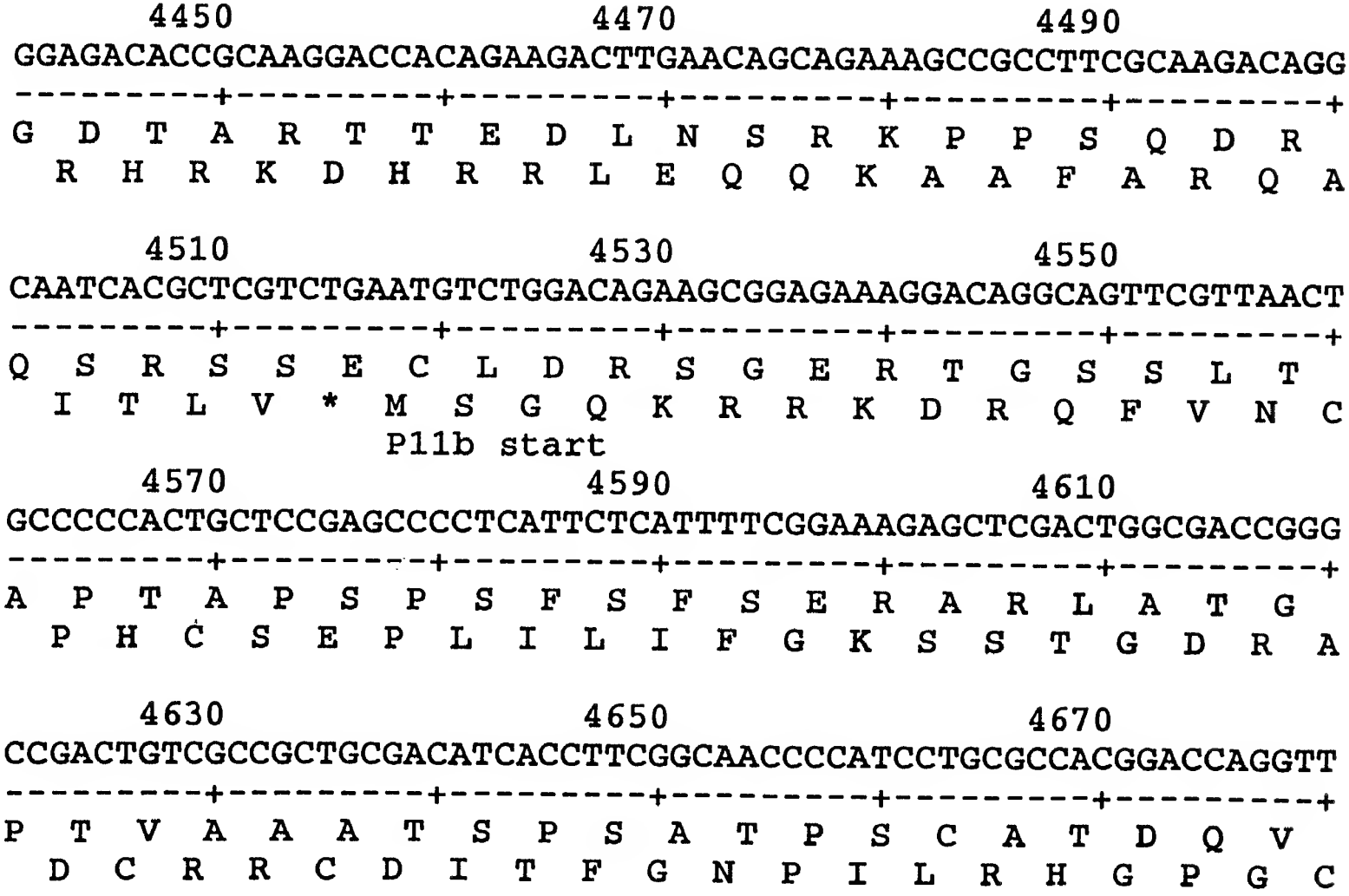


FIG. 2 Cont'd

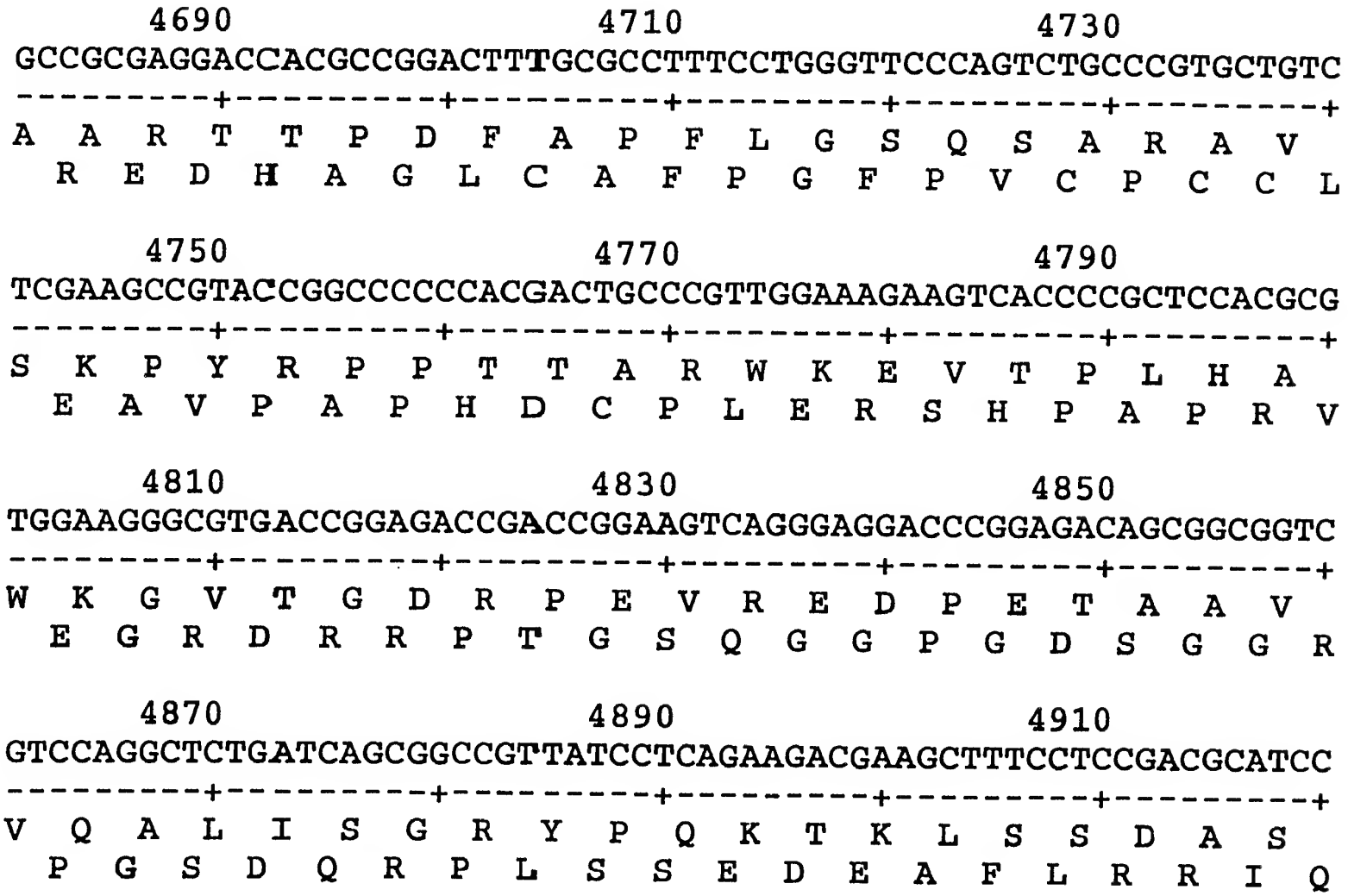


FIG. 2 Cont'd

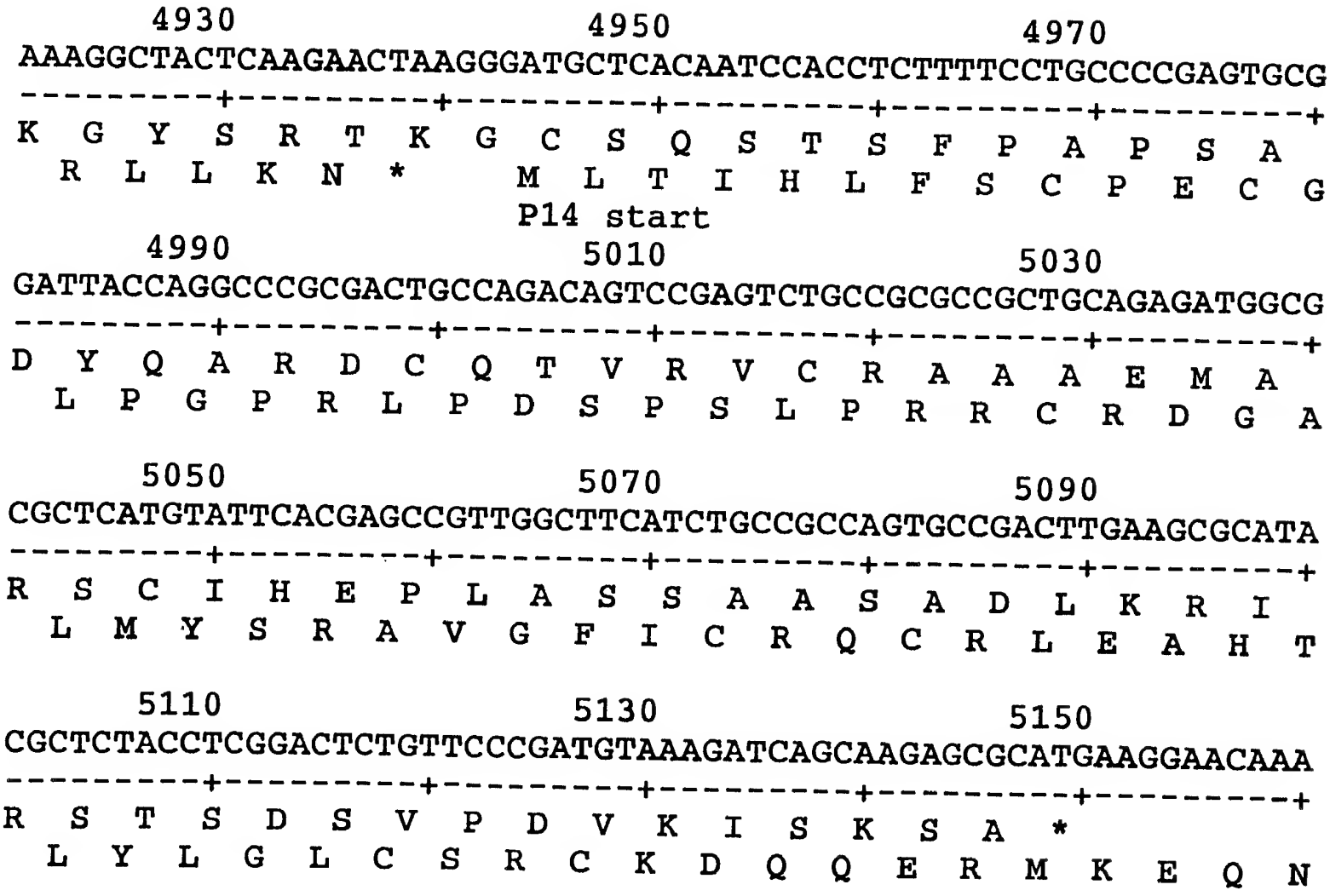


FIG. 2 Cont'd

```
        5170                5190                5210
ATTAGTTTCCTTGTTCGTAAACAAGGTGGTCCCTCCCATTGAGGTAAAGACTCTGGTGAG
---------+---------+---------+---------+---------+---------+
  *

        5230                5250                5270
TCCTCAACGTTACTCGTTGAGTCTGCTGCGGTTCGATTCCATTCCCAAGCAGCAAAGGGT
---------+---------+---------+---------+---------+---------+

        5290                5310
GCGCAACTAGTACGGCGCCCCCTGGGATACCA
---------+---------+---------+--
```

FIG. 2 Cont'd

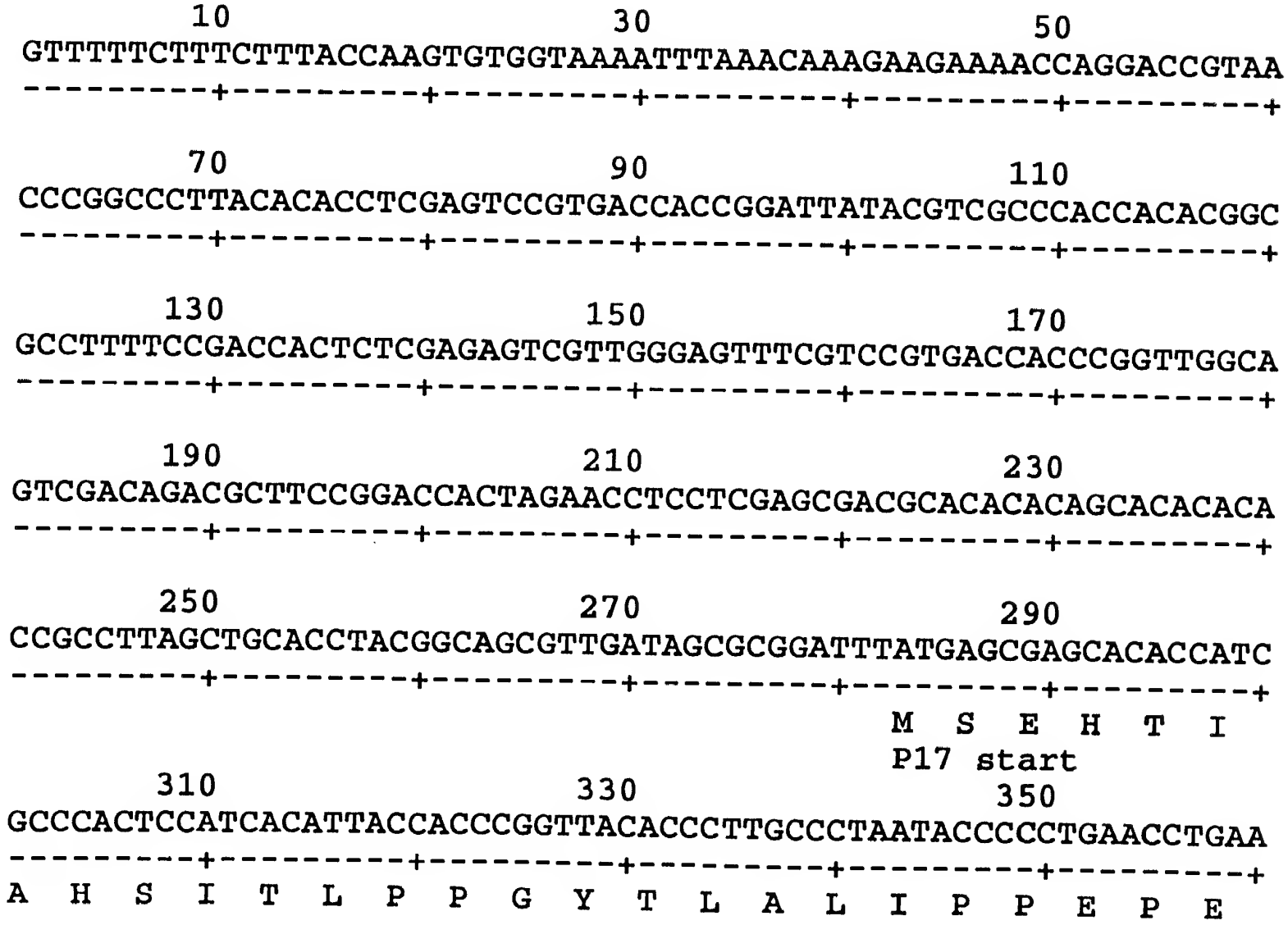

10
30
50
GTTTTTCTTTCTTTACCAAGTGTGGTAAAATTTAAACAAAGAAGAAAACCAGGACCGTAA
70
90
110
CCCGGCCCTTACACACCTCGAGTCCGTGACCACCGGATTATACGTCGCCCACCACACGGC
130
150
170
GCCTTTTCCGACCACTCTCGAGAGTCGTTGGGAGTTTCGTCCGTGACCACCCGGTTGGCA
190
210
230
GTCGACAGACGCTTCCGGACCACTAGAACCTCCTCGAGCGACGCACACACAGCACACACA
250
270
290
CCGCCTTAGCTGCACCTACGGCAGCGTTGATAGCGCGGATTTATGAGCGAGCACACCATC
M S E H T I
P17 start
310
330
350
GCCCACTCCATCACATTACCACCCGGTTACACCCTTGCCCTAATACCCCCTGAACCTGAA
A H S I T L P P G Y T L A L I P P E P E

FIG. 3a

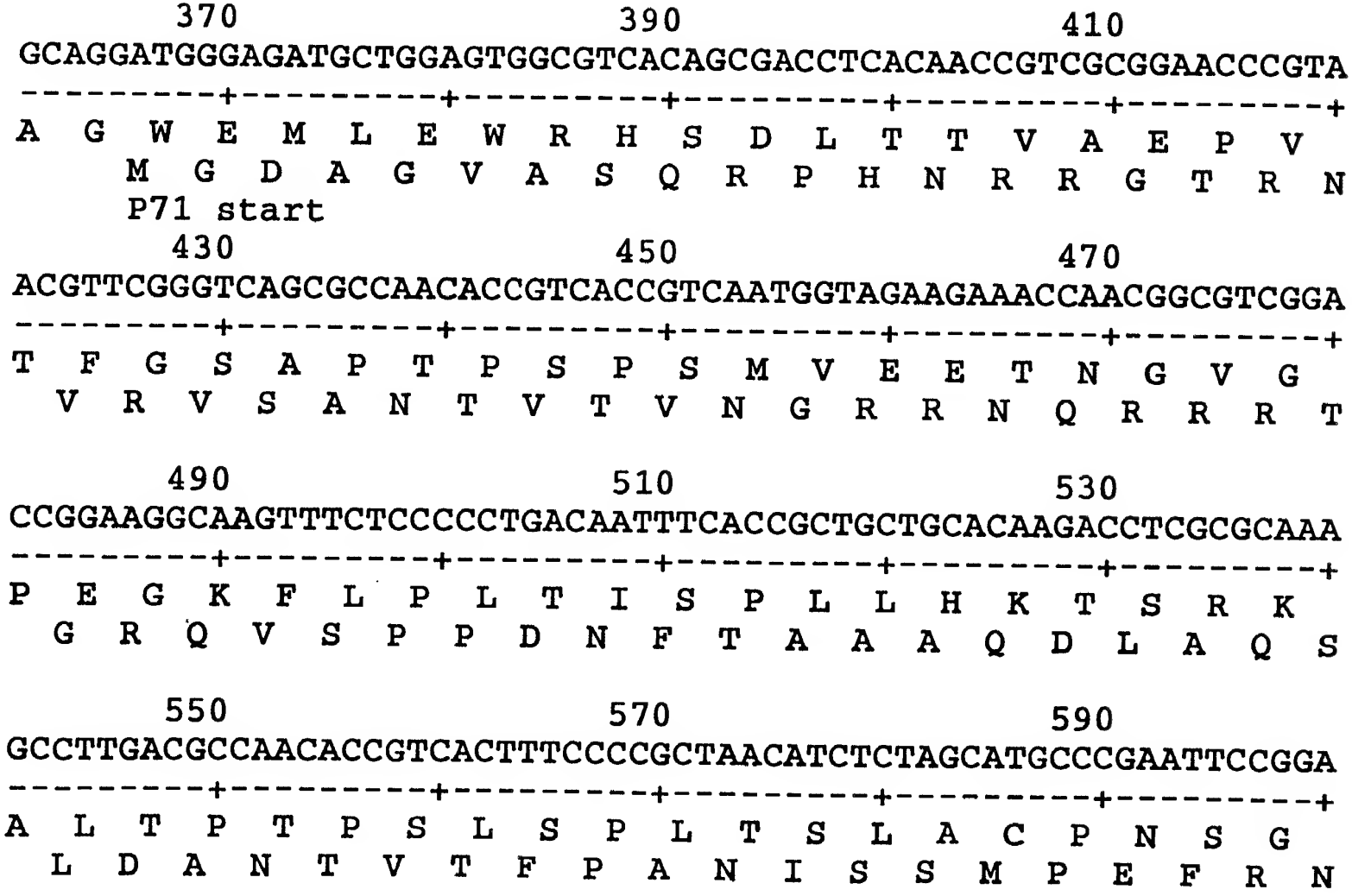

370
390
410
GCAGGATGGGAGATGCTGGAGTGGCGTCACAGCGACCTCACAACCGTCGCGGAACCCGTA
A G W E M L E W R H S D L T T V A E P V
M G D A G V A S Q R P H N R R G T R N
P71 start
430
450
470
ACGTTCGGGTCAGCGCCAACACCGTCACCGTCAATGGTAGAAGAAACCAACGGCGTCGGA
T F G S A P T P S P S M V E E T N G V G
V R V S A N T V T V N G R R N Q R R R T
490
510
530
CCGGAAGGCAAGTTTCTCCCCCTGACAATTTCACCGCTGCTGCACAAGACCTCGCGCAAA
P E G K F L P L T I S P L L H K T S R K
G R Q V S P P D N F T A A A Q D L A Q S
550
570
590
GCCTTGACGCCAACACCGTCACTTTCCCCGCTAACATCTCTAGCATGCCCGAATTCCGGA
A L T P T P S L S P L T S L A C P N S G
L D A N T V T F P A N I S S M P E F R N

FIG. 3a Cont'd

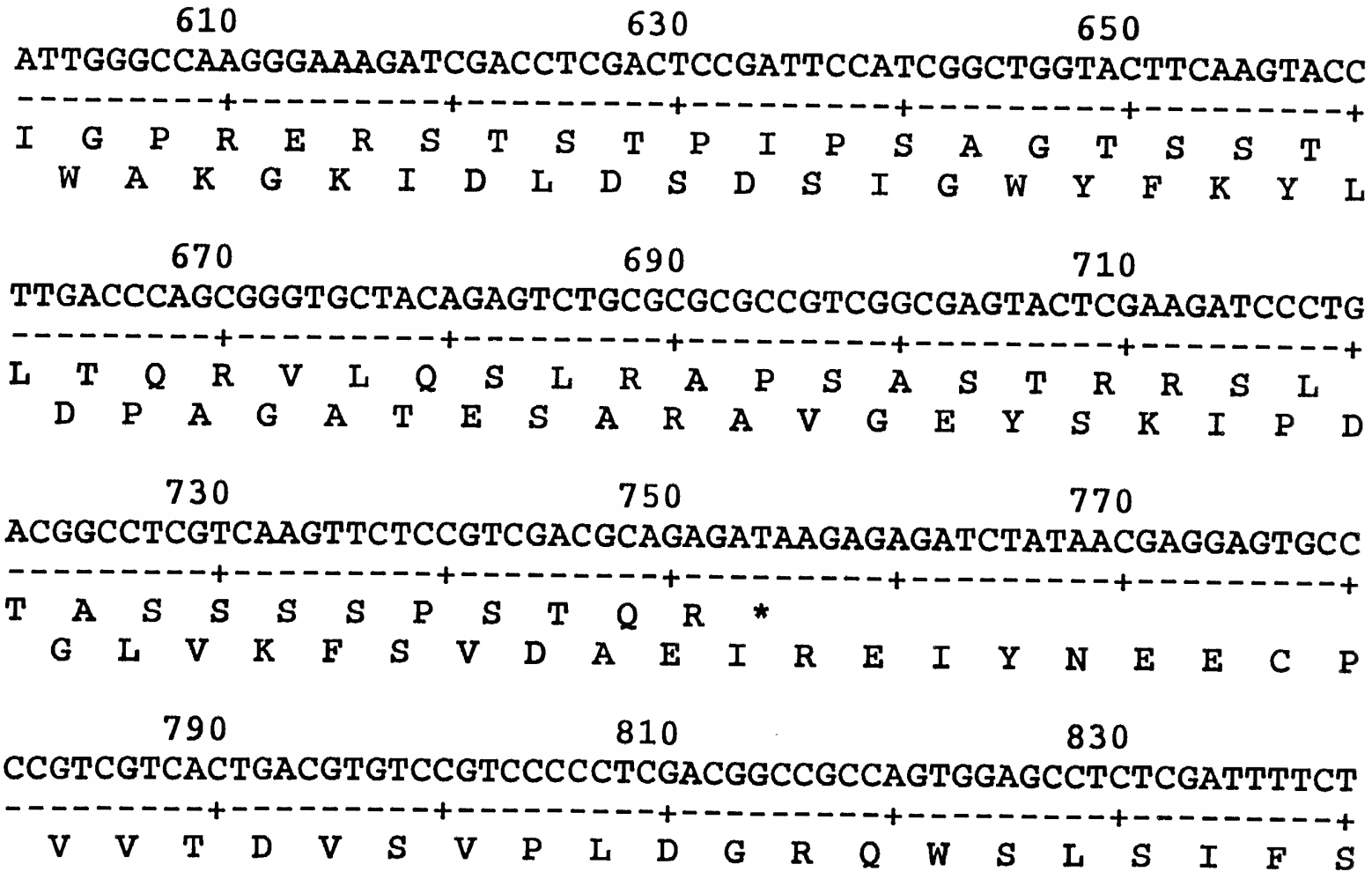


FIG. 3a Cont'd

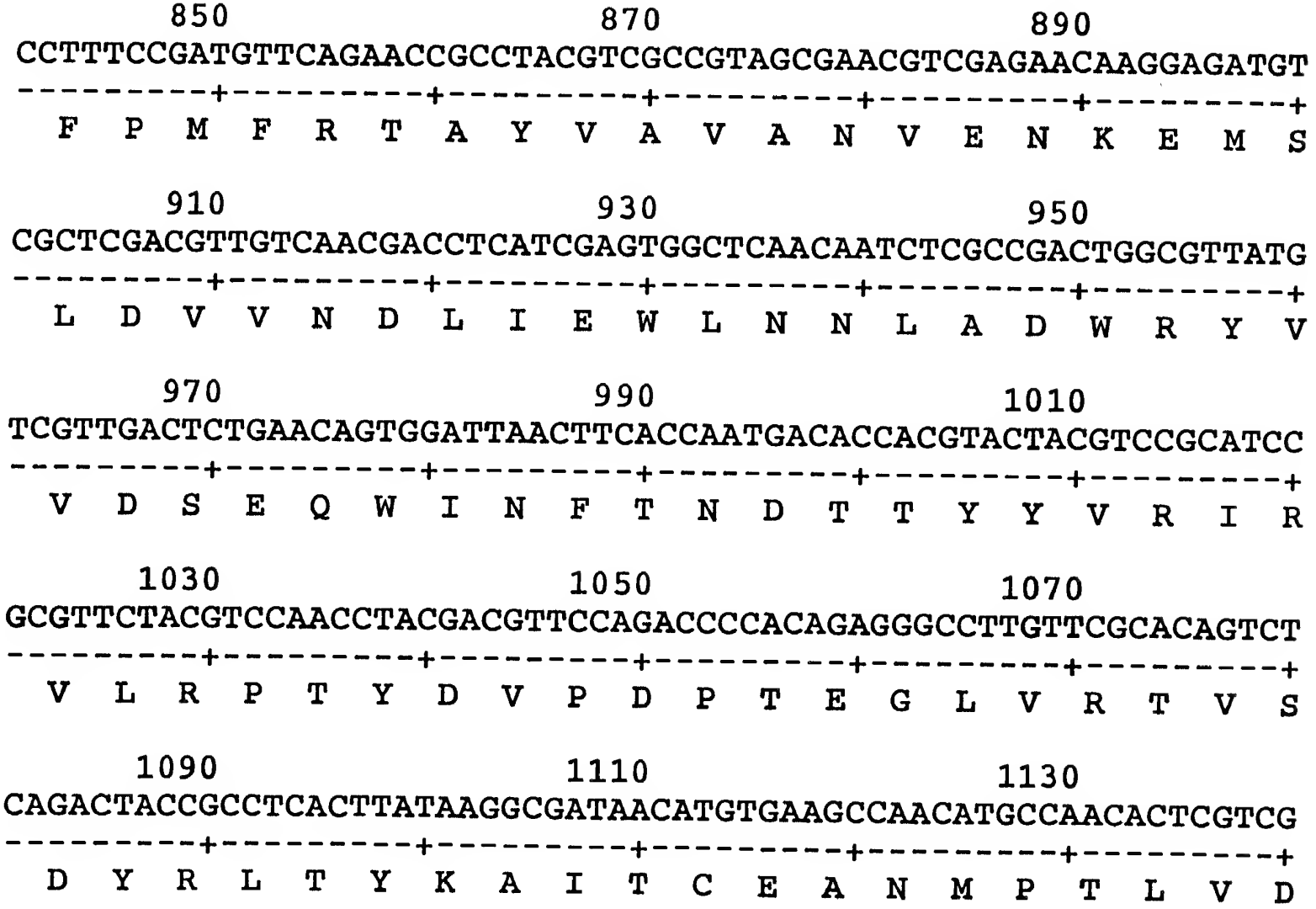


FIG. 3a Cont'd

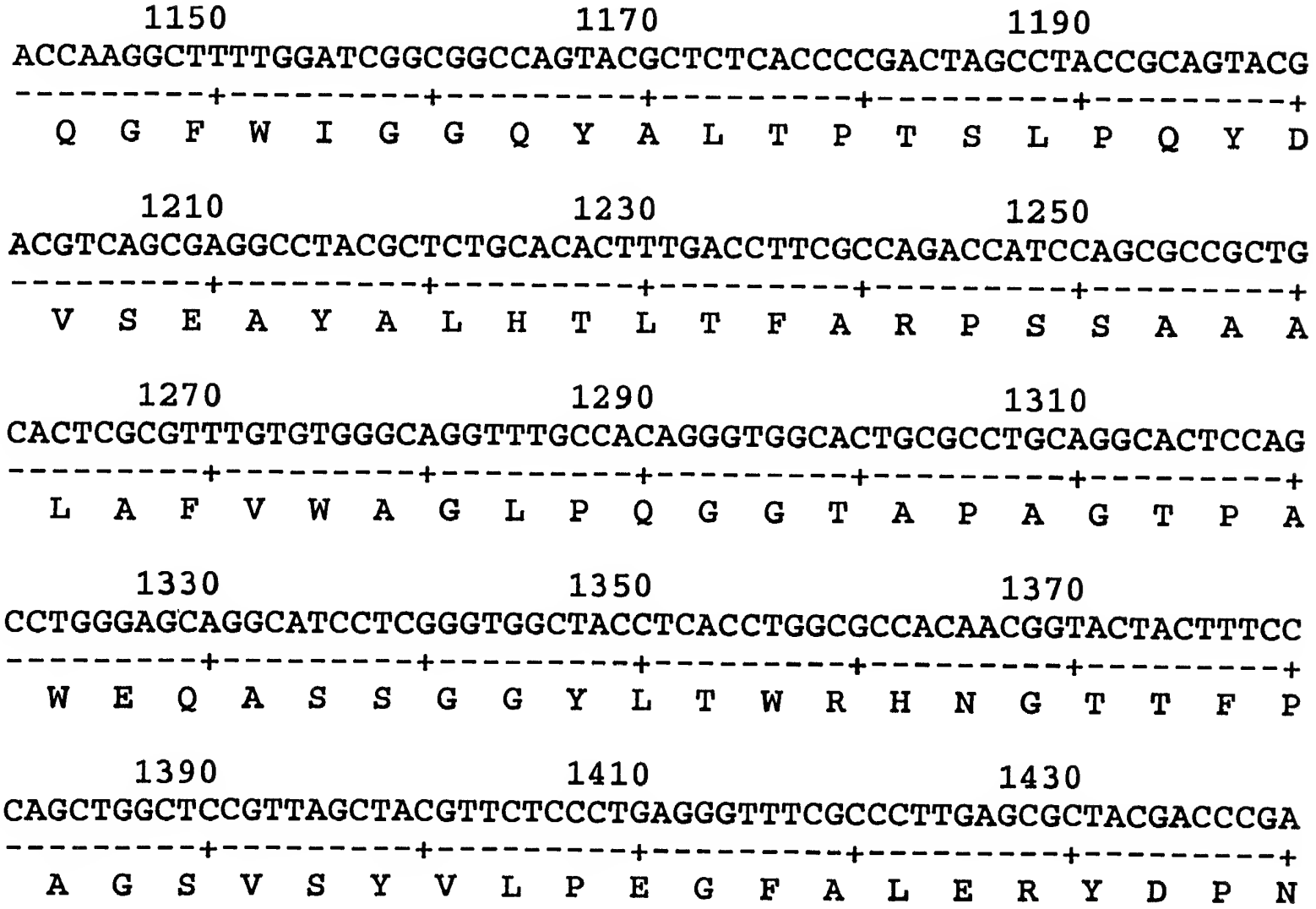


FIG. 3a Cont'd

```
        1450                1470                1490
ACGACGGCTCTTGGACCGACTTCGCTTCCGCAGGAGACACCGTCACTTTCCGGCAGGTCG
---------+---------+---------+---------+---------+---------+
 D  G  S  W  T  D  F  A  S  A  G  D  T  V  T  F  R  Q  V  A

        1510                1530                1550
CCGTCGACGAGGTCGTTGTGACCAACAACCCCGCCGGCGGCGGCAGCGCCCCCACCTTCA
---------+---------+---------+---------+---------+---------+
 V  D  E  V  V  V  T  N  N  P  A  G  G  G  S  A  P  T  F  T

        1570                1590                1610
CCGTGAGAGTGCCCCCTTCAAACGCTTACACCAACACCGTGTTTAGGAACACGCTCTTAG
---------+---------+---------+---------+---------+---------+
 V  R  V  P  P  S  N  A  Y  T  N  T  V  F  R  N  T  L  L  E

        1630                1650                1670
AGACTCGACCCTCCTCTCGTAGGCTCGAACTCCCTATGCCACCTGCTGACTTTGGACAGA
---------+---------+---------+---------+---------+---------+
 T  R  P  S  S  R  R  L  E  L  P  M  P  P  A  D  F  G  Q  T

        1690                1710                1730
CGGTCGCCAACAACCCGAAGATCGAGCAGTCGCTTCTTAAAGAAACACTTGGCTGCTATT
---------+---------+---------+---------+---------+---------+
 V  A  N  N  P  K  I  E  Q  S  L  L  K  E  T  L  G  C  Y  L
```

FIG. 3.a Cont'd

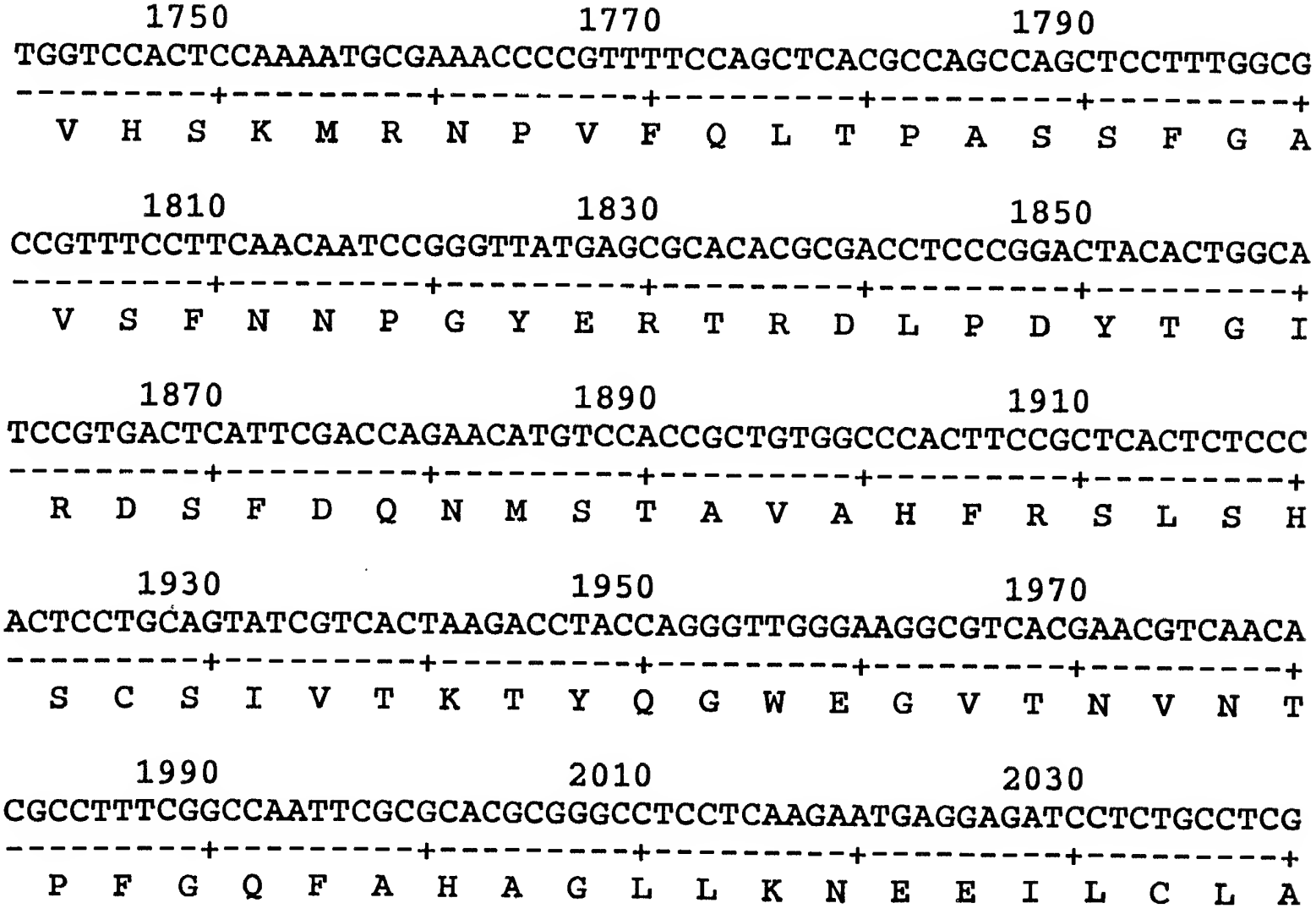


FIG. 3a Cont'd

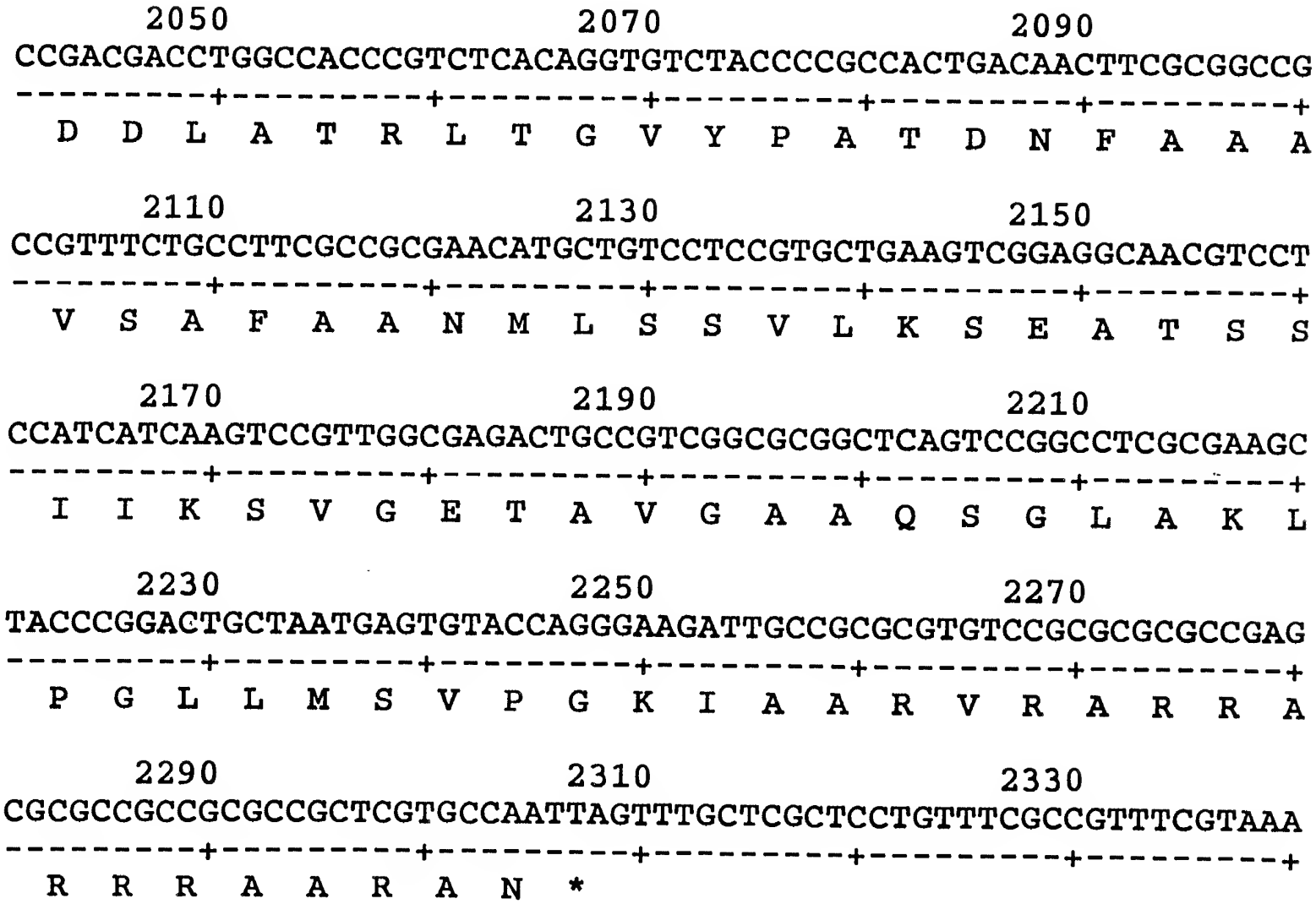


FIG. 3a Cont'd

```
      2350                 2370                 2390
ACGGCGTGGTCCCGCACATTACGCGTACCCTAAAGACTCTGGTGAGTCCCCGTCGTTACA
---------+---------+---------+---------+---------+---------+

      2410                 2430                 2450
CGACGGGTCTGCCGCGGTTCGATTCCATTCCCAAGCGGCAAGAAGGACGTAGTTAGCTCT
---------+---------+---------+---------+---------+---------+

      2470
GCGTCCCTCGGGATACCA
---------+--------
```

FIG. 3a Cont'd

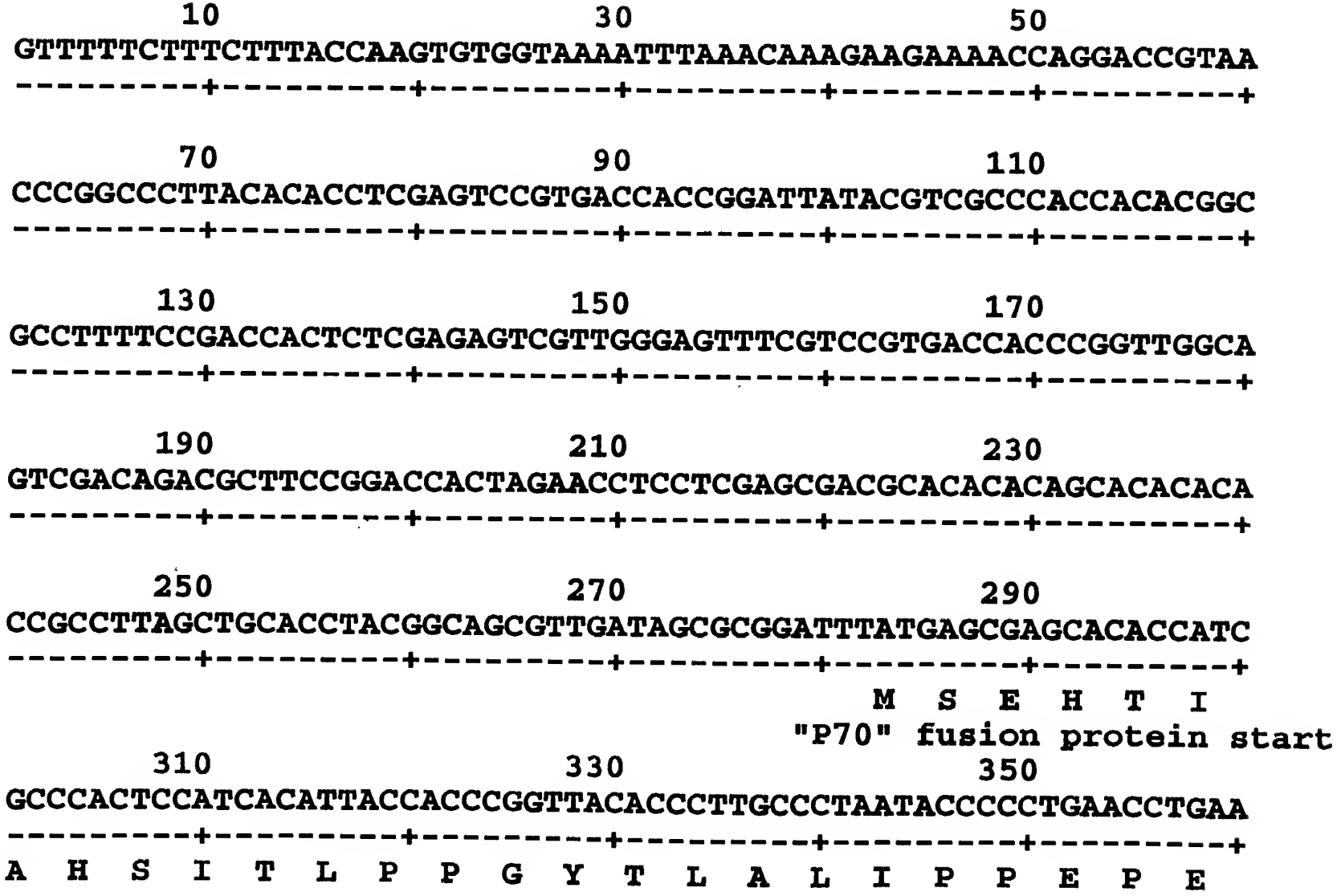


Fig. 3b

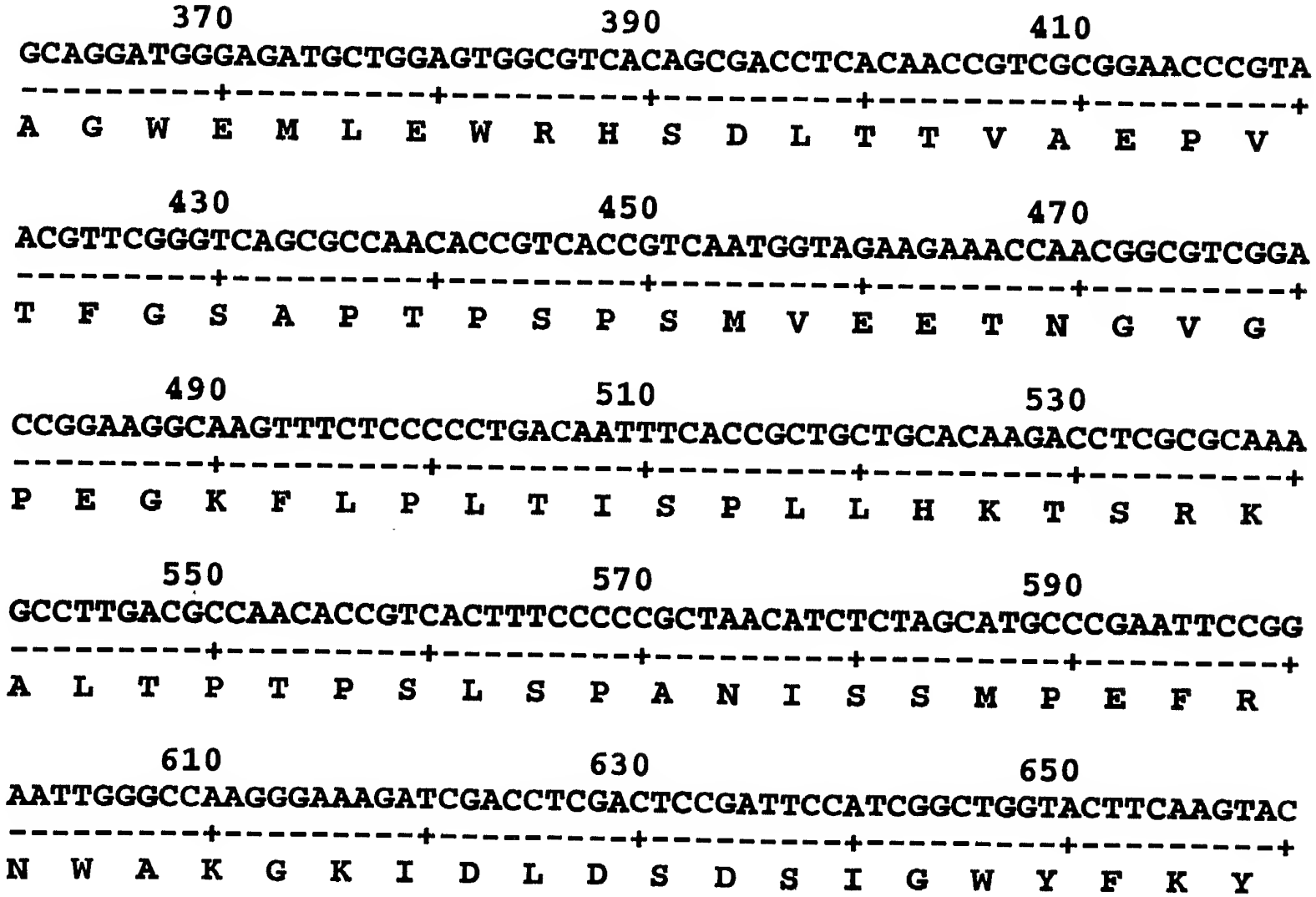


Fig. 3b (cont'd)

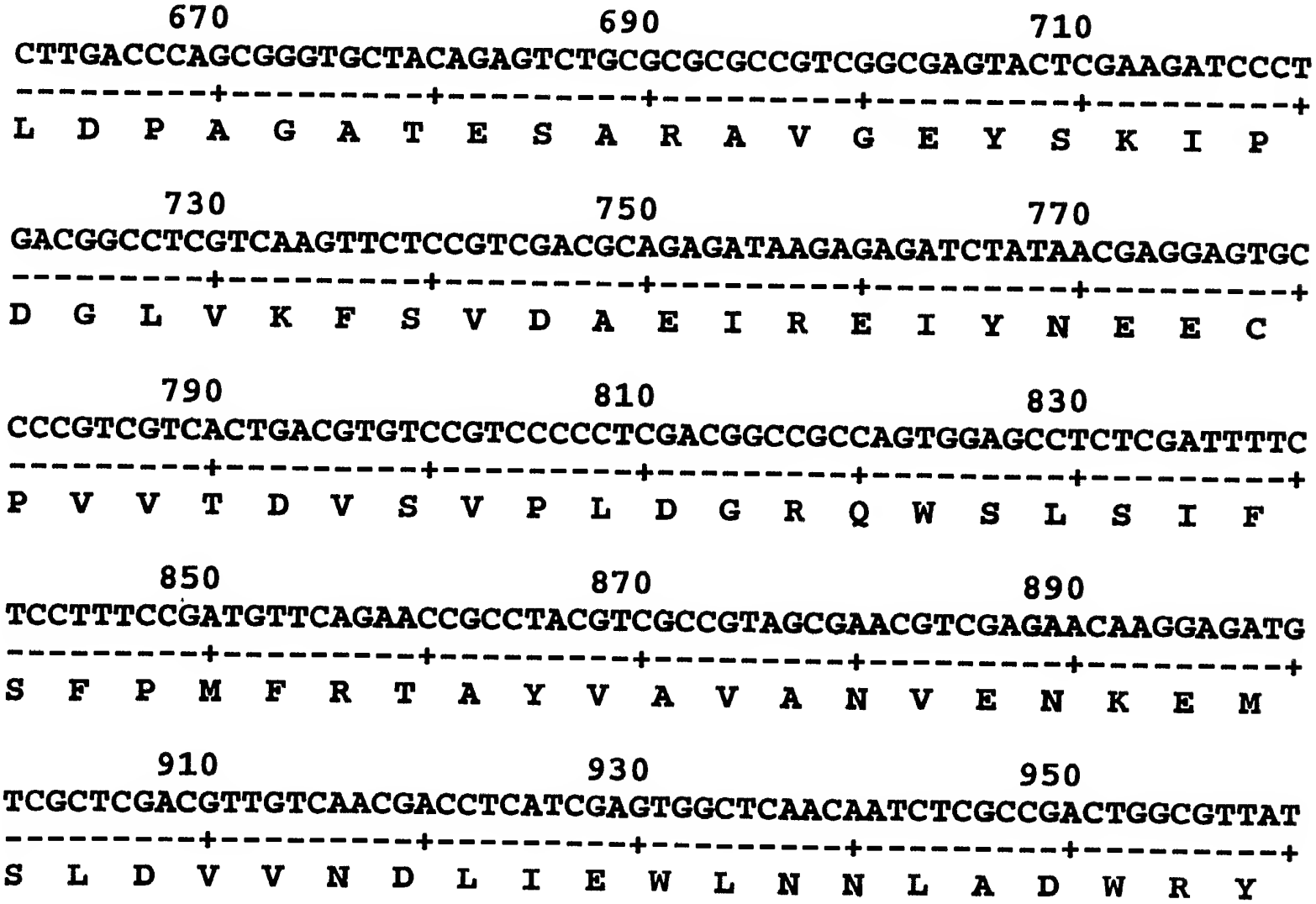


Fig. 3b(cont'd)

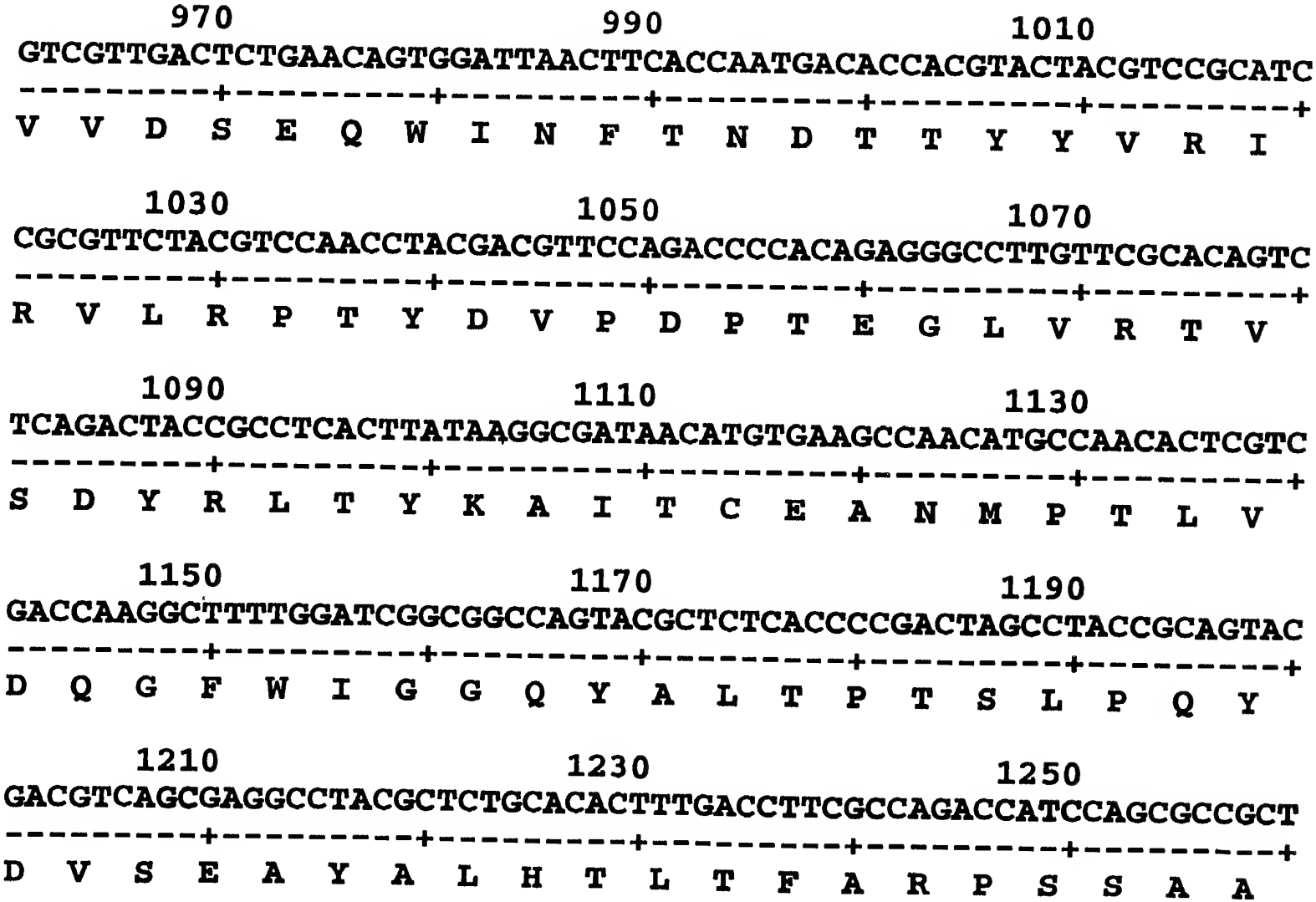


Fig. 3b (cont'd)

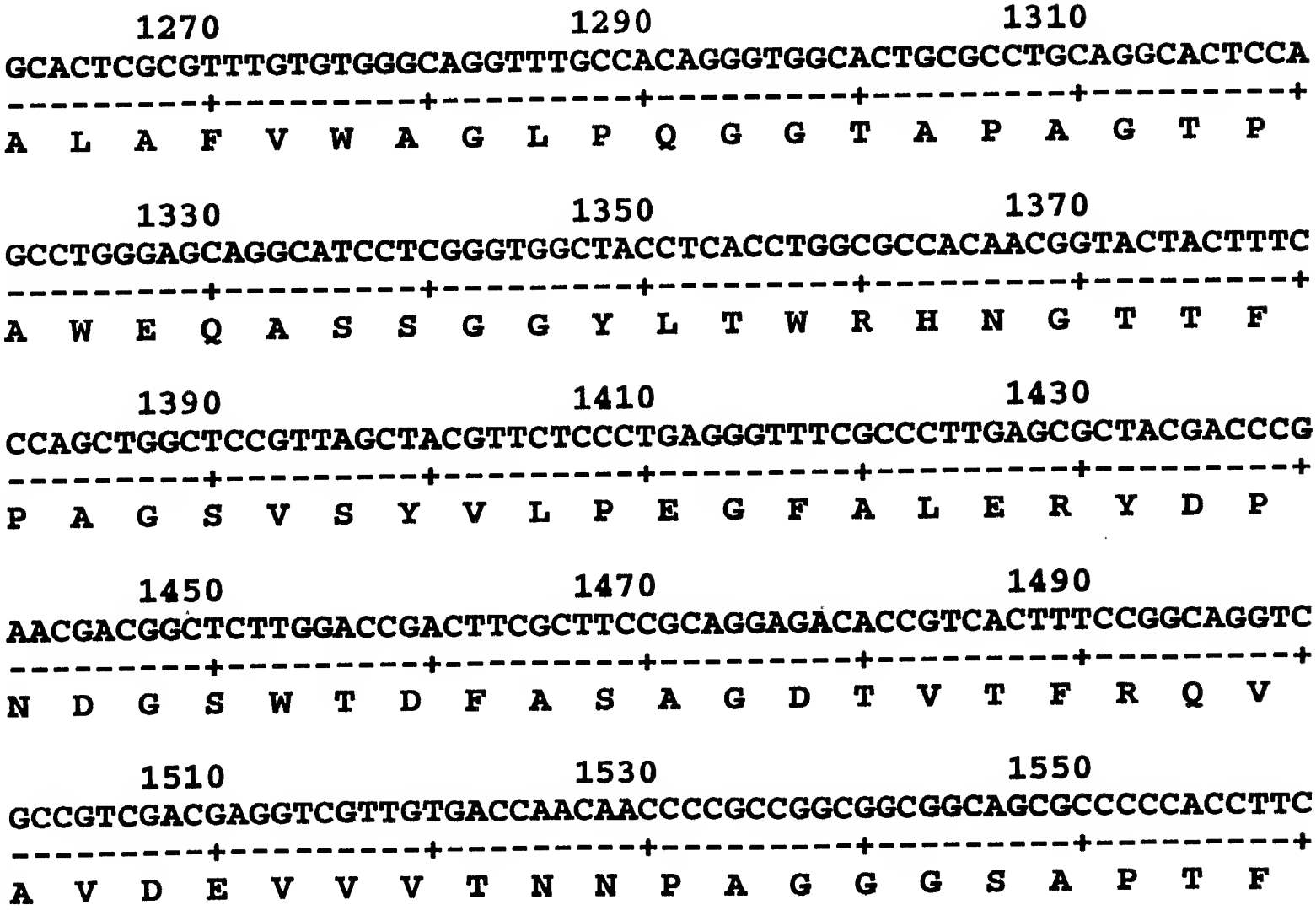


Fig. 3b (cont'd)

```
        1570                          1590                          1610
ACCGTGAGAGTGCCCCCTTCAAACGCTTACACCAACACCGTGTTTAGGAACACGCTCTTA
---------+---------+---------+---------+---------+---------+
T  V  R  V  P  P  S  N  A  Y  T  N  T  V  F  R  N  T  L  L

        1630                          1650                          1670
GAGACTCGACCCTCCTCTCGTAGGCTCGAACTCCCTATGCCACCTGCTGACTTTGGACAG
---------+---------+---------+---------+---------+---------+
E  T  R  P  S  S  R  R  L  E  L  P  M  P  P  A  D  F  G  Q

        1690                          1710                          1730
ACGGTCGCCAACAACCCGAAGATCGAGCAGTCGCTTCTTAAAGAAACACTTGGCTGCTAT
---------+---------+---------+---------+---------+---------+
T  V  A  N  N  P  K  I  E  Q  S  L  L  K  E  T  L  G  C  Y

        1750                          1770                          1790
TTGGTCCACTCCAAAATGCGAAACCCCGTTTTCCAGCTCACGCCAGCCAGCTCCTTTGGC
---------+---------+---------+---------+---------+---------+
L  V  H  S  K  M  R  N  P  V  F  Q  L  T  P  A  S  S  F  G

        1810                          1830                          1850
GCCGTTTCCTTCAACAATCCGGGTTATGAGCGCACACGCGACCTCCCGGACTACACTGGC
---------+---------+---------+---------+---------+---------+
A  V  S  F  N  N  P  G  Y  E  R  T  R  D  L  P  D  Y  T  G
```

Fig. 3b (cont'd)

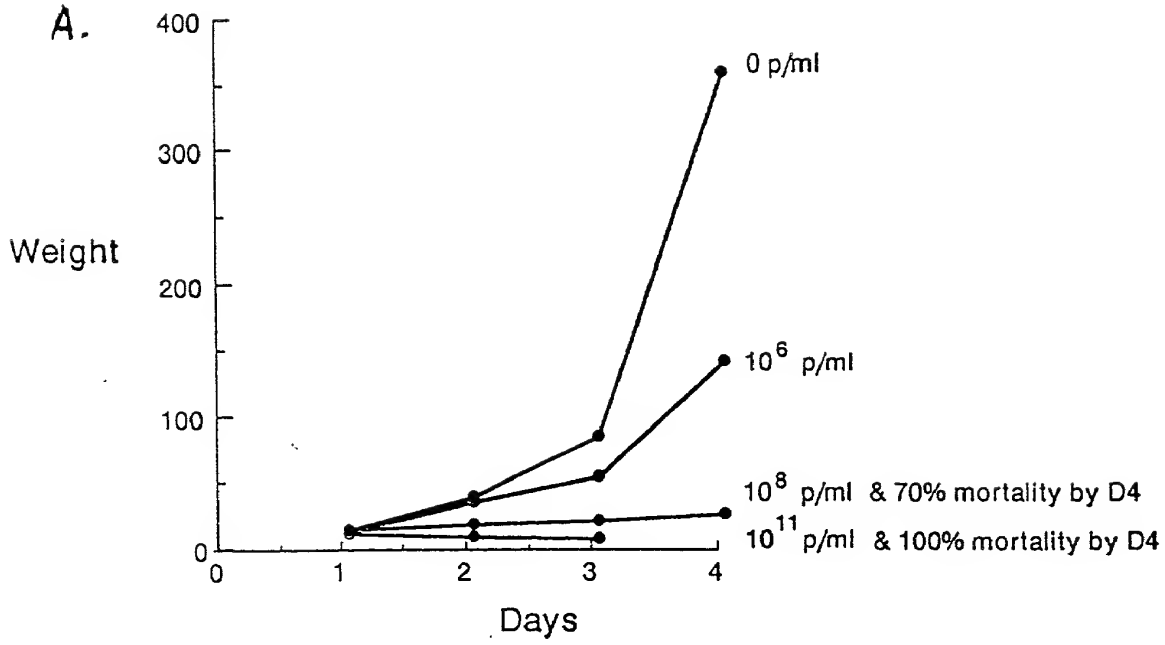
```
        1870                1890                1910
ATCCGTGACTCATTCGACCAGAACATGTCCACCGCTGTGGCCCACTTCCGCTCACTCTCC
---------+---------+---------+---------+---------+---------+
I  R  D  S  F  D  Q  N  M  S  T  A  V  A  H  F  R  S  L  S

        1930                1950                1970
CACTCCTGCAGTATCGTCACTAAGACCTACCAGGGTTGGGAAGGCGTCACGAACGTCAAC
---------+---------+---------+---------+---------+---------+
H  S  C  S  I  V  T  K  T  Y  Q  G  W  E  G  V  T  N  V  N

        1990                2010                2030
ACGCCTTTCGGCCAATTCGCGCACGCGGGCCTCCTCAAGAATGAGGAGATCCTCTGCCTC
---------+---------+---------+---------+---------+---------+
T  P  F  G  Q  F  A  H  A  G  L  L  K  N  E  E  I  L  C  L

        2050                2070                2090
GCCGACGACCTGGCCACCCGTCTCACAGGTGTCTACCCCGCCACTGACAACTTCGCGGCC
---------+---------+---------+---------+---------+---------+
A  D  D  L  A  T  R  L  T  G  V  Y  P  A  T  D  N  F  A  A

        2110                2130                2150
GCCGTTTCTGCCTTCGCCGCGAACATGCTGTCCTCCGTGCTGAAGTCGGAGGCAACGTCC
---------+---------+---------+---------+---------+---------+
A  V  S  A  F  A  A  N  M  L  S  S  V  L  K  S  E  A  T  S
```

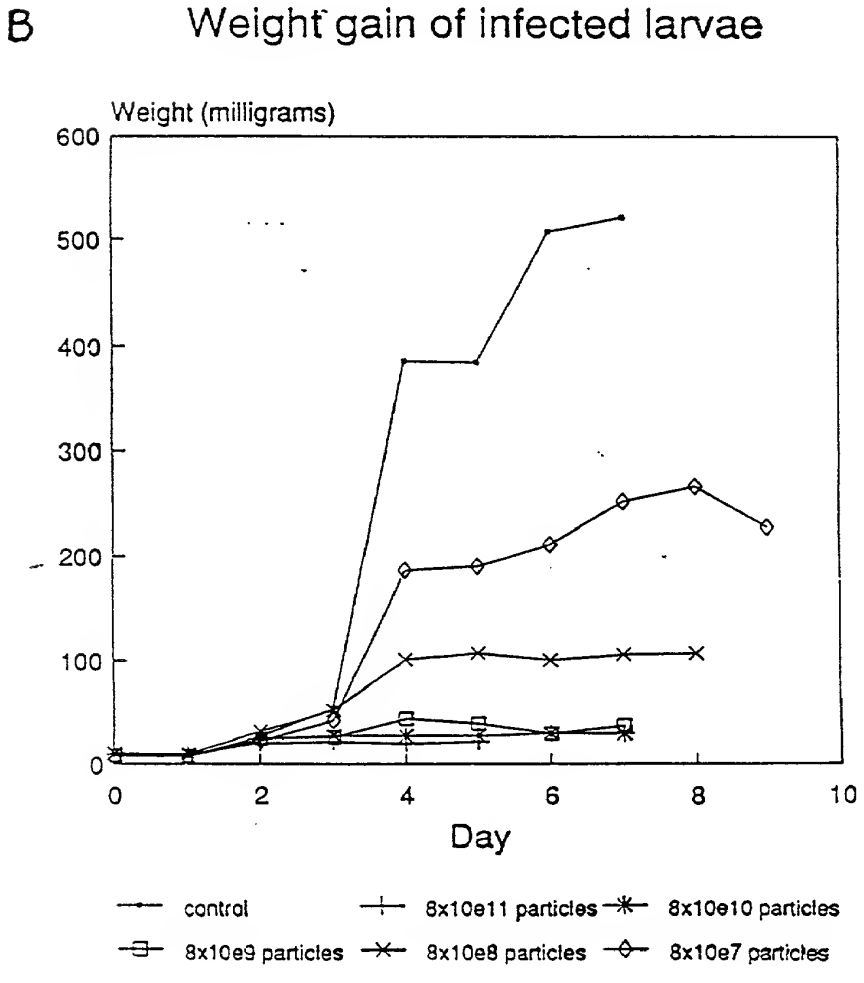
Fig. 3b (cont'd)

```
      2170                    2190                    2210
TCCATCATCAAGTCCGTTGGCGAGACTGCCGTCGGCGCGGCTCAGTCCGGCCTCGCGAAG
--------+---------+---------+---------+---------+---------+---------+
S   I   I   K   S   V   G   E   T   A   V   G   A   A   Q   S   G   L   A   K

      2230                    2250                    2270
CTACCCGGACTGCTAATGAGTGTACCAGGGAAGATTGCCGCGCGTGTCCGCGCGCGCCGA
--------+---------+---------+---------+---------+---------+---------+
L   P   G   L   L   M   S   V   P   G   K   I   A   A   R   V   R   A   R   R

      2290                    2310                    2330
GCGCGCCGCCGCGCCGCTCGTGCCAATTAGTTTGCTCGCTCCTGTTTCGCCGTTTCGTAA
--------+---------+---------+---------+---------+---------+---------+
A   R   R   R   A   A   R   A   N   *

      2350                    2370                    2390
AACGGCGTGGTCCCGCACATTACGCGTACCCTAAAGACTCTGGTGAGTCCCCGTCGTTAC
--------+---------+---------+---------+---------+---------+---------+

      2410                    2430                    2450
ACGACGGGTCTGCCGCGGTTCGATTCCATTCCCAAGCGGCAAGAAGGACGTAGTTAGCTC
--------+---------+---------+---------+---------+---------+---------+

      2470
TGCGTCCCTCGGGATACCA
--------+---------
```

Fig. 3b (cont'd)

FIG. 4


A.
Weight
400
300
200
100
0
0
1
2
3
4
Days
0 p/ml
10^6 p/ml
10^8 p/ml & 70% mortality by D4
10^11 p/ml & 100% mortality by D4


B
Weight gain of infected larvae
Weight (milligrams)
600
500
400
300
200
100
0
0
2
4
6
8
10
Day
control
8x10e11 particles
8x10e10 particles
8x10e9 particles
8x10e8 particles
8x10e7 particles

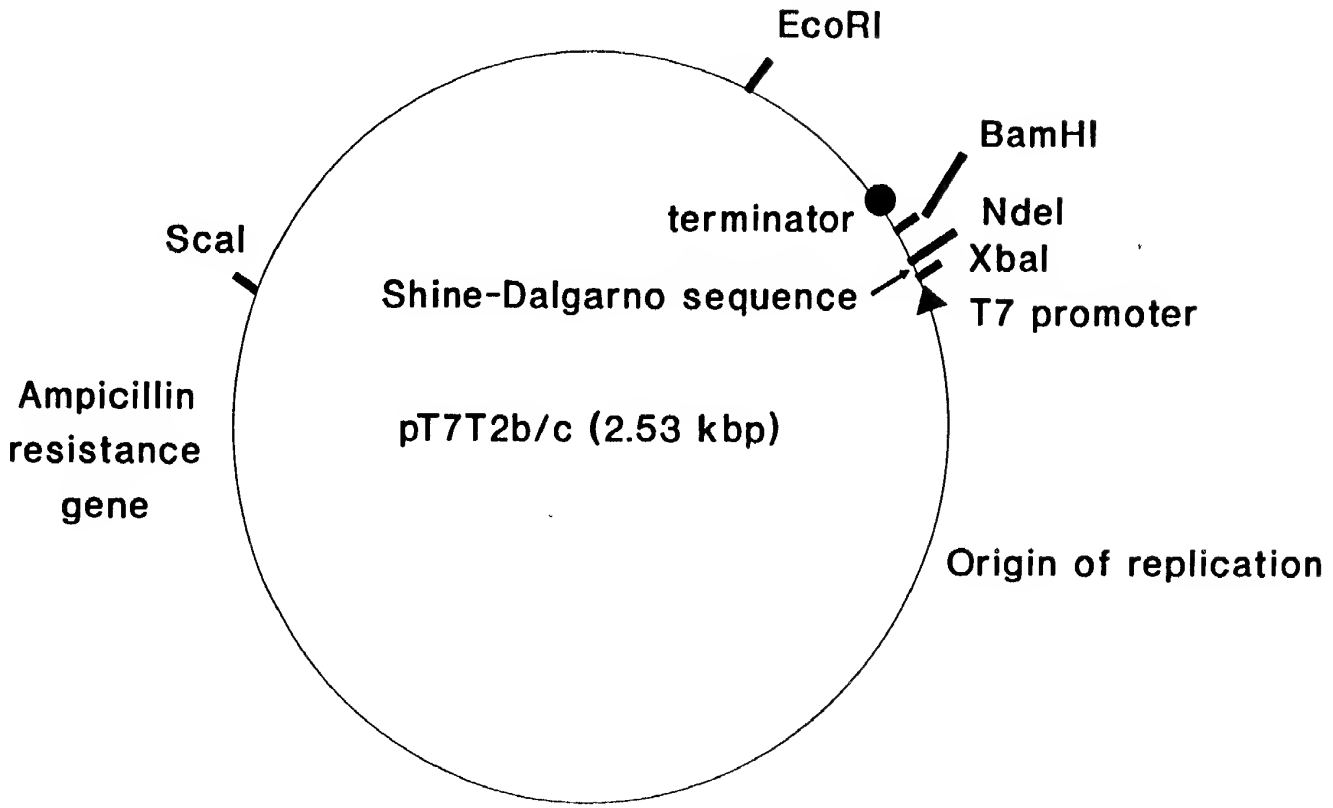


Fig. 5

Proteins encoded by the HaSV genome

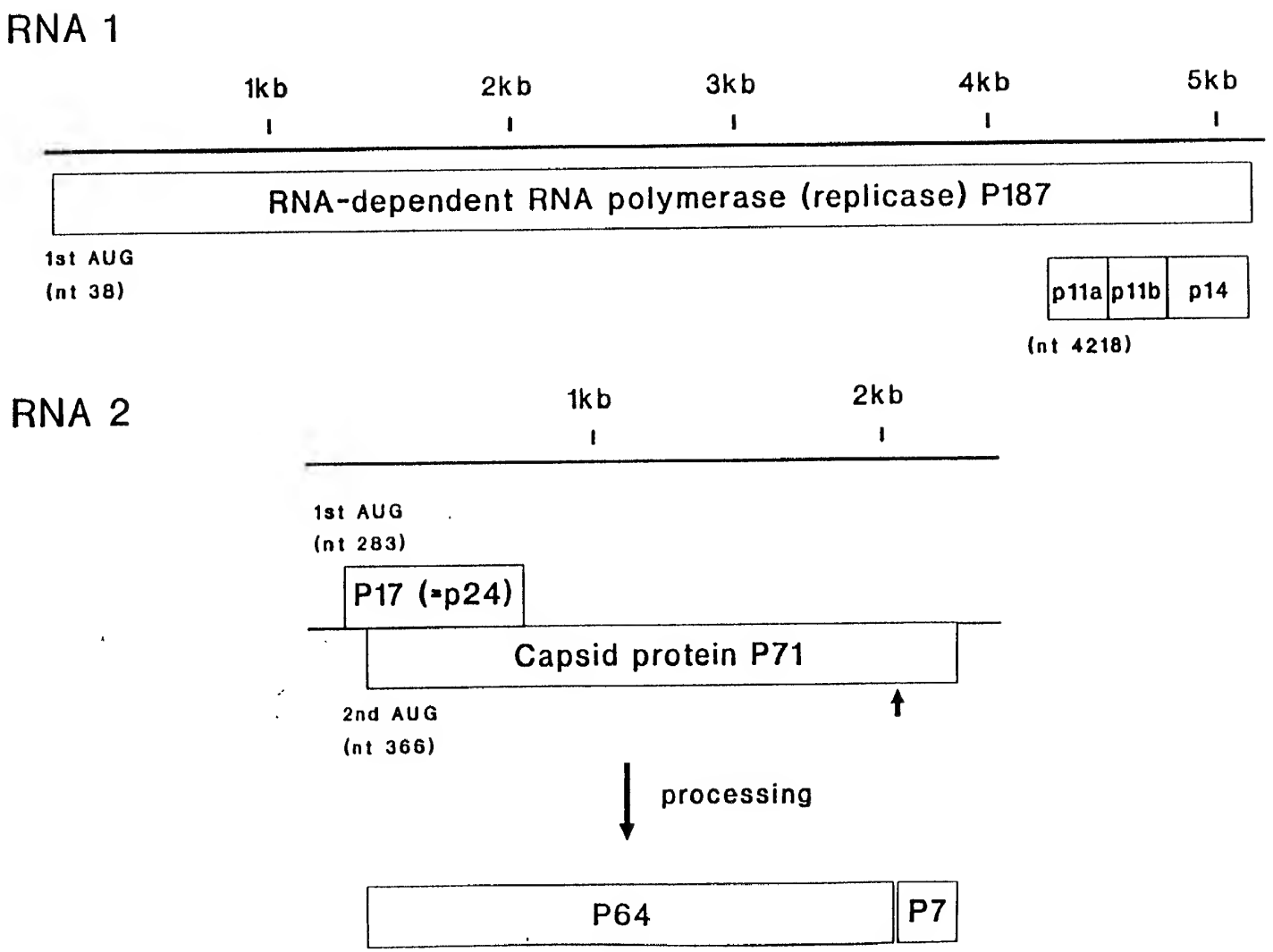


FIG. 6

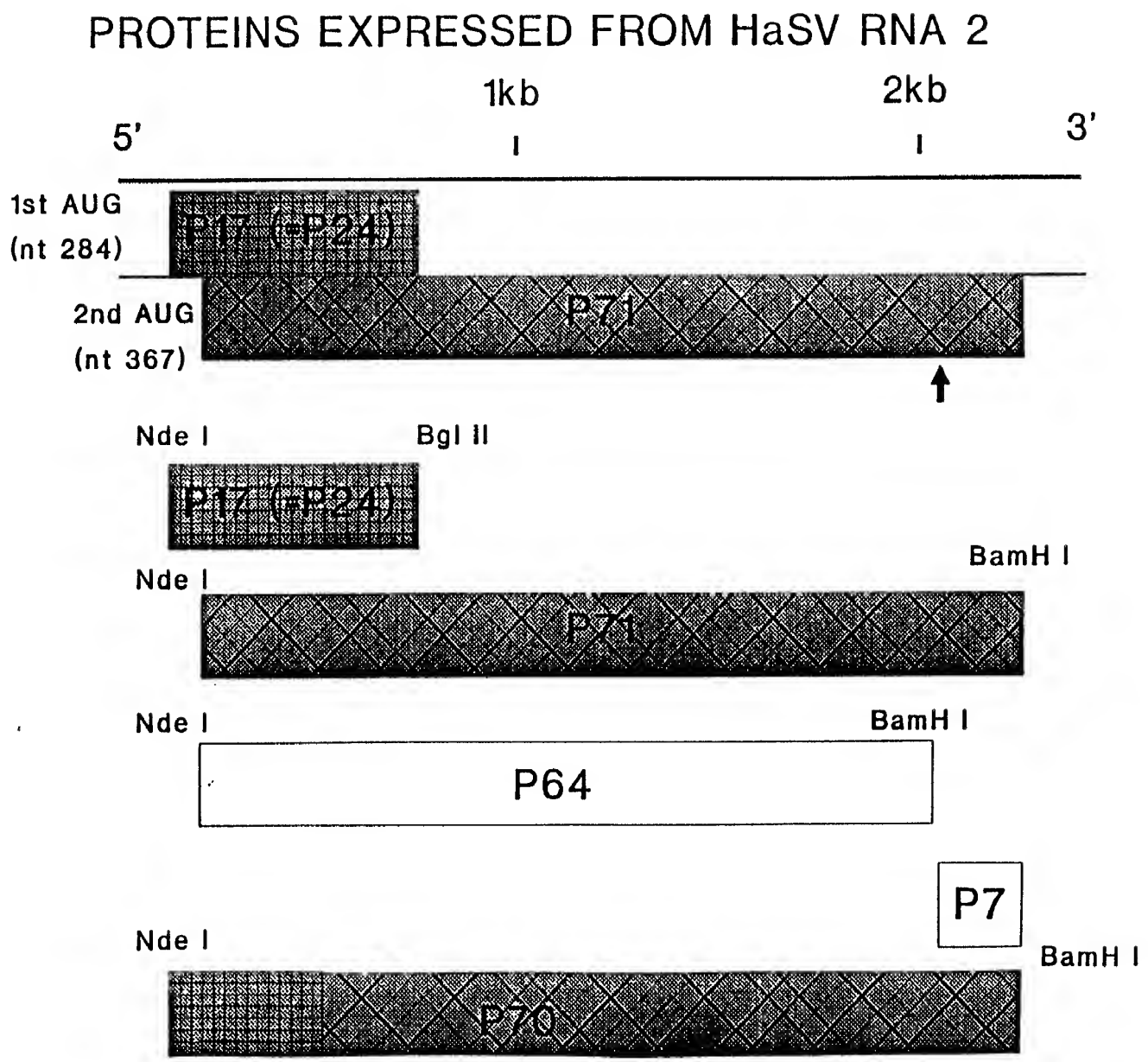
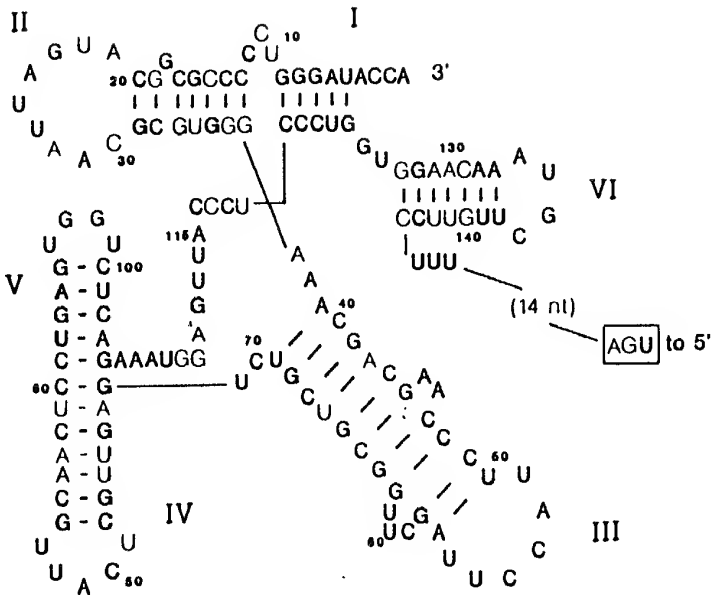


FIG. 7

HaSV RNA 3' - terminal tRNA-like structures

RNA 1



RNA 2

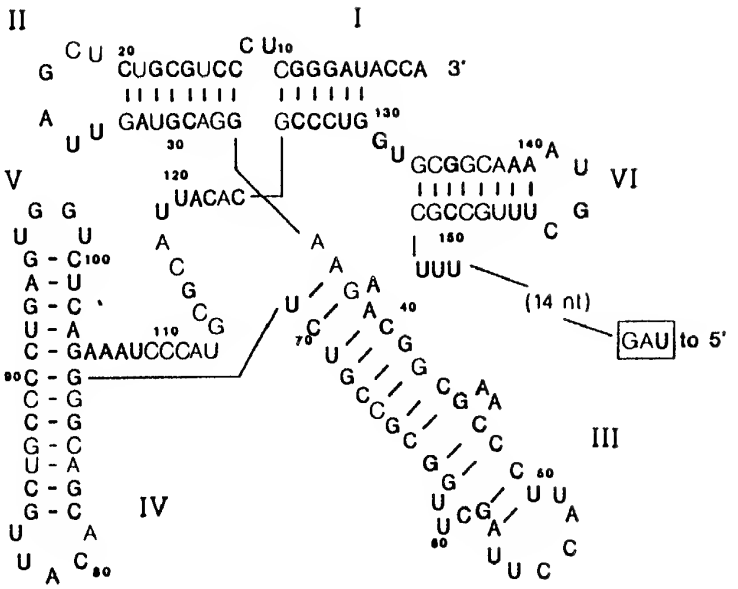


FIG. 8

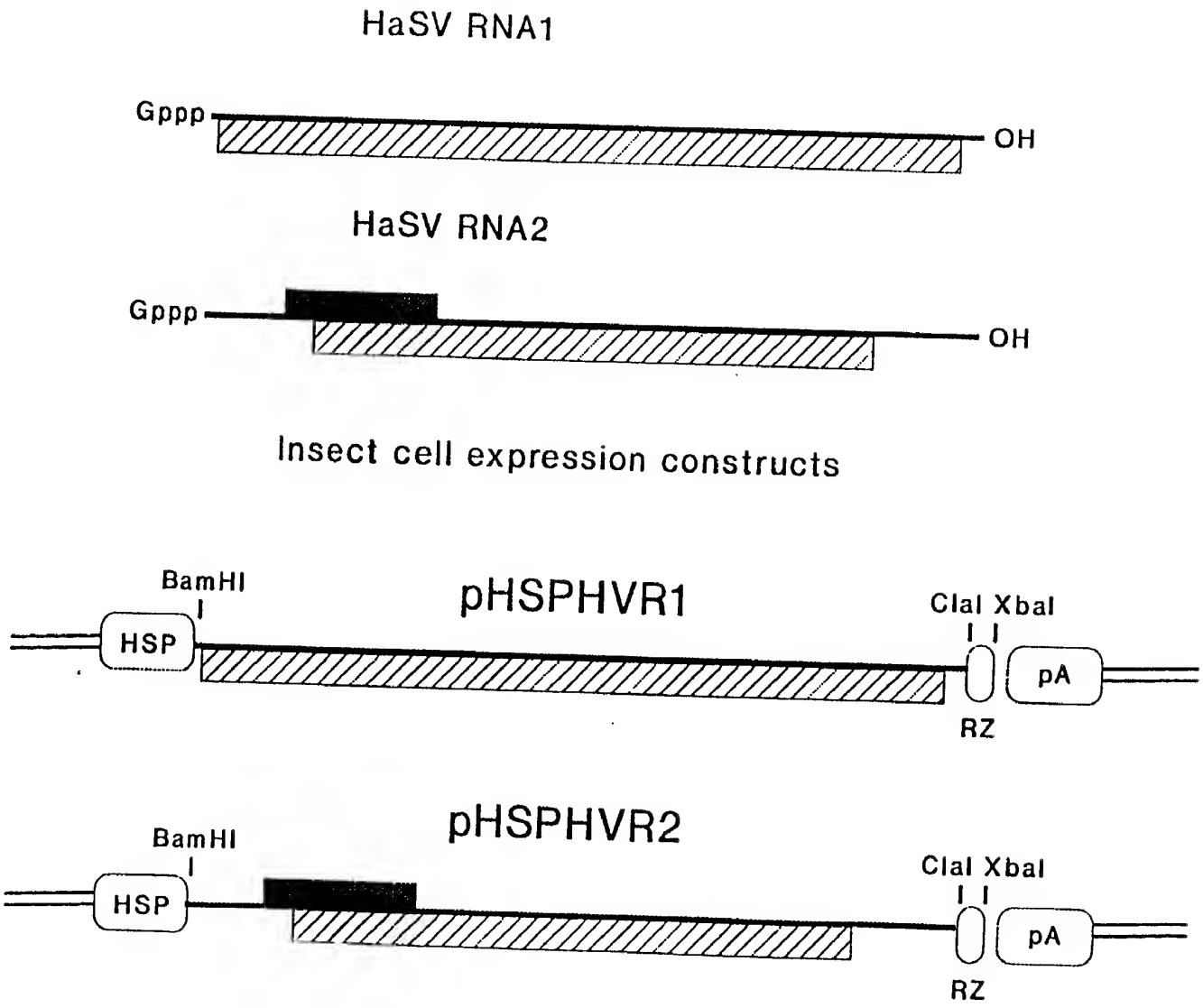
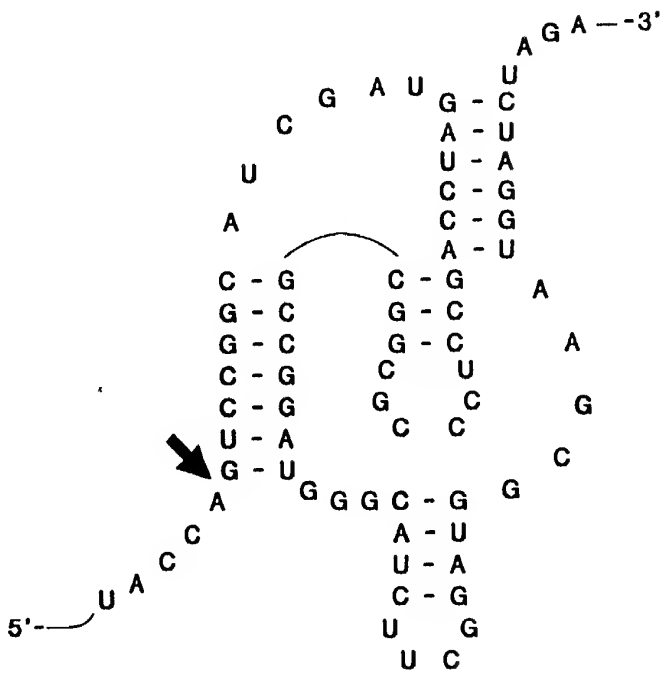


Fig. 9

CIS-ACTING RIBOZYMES FOR HASV 3' ENDS

HEPATITIS DELTA VIRUS



HAIRPIN

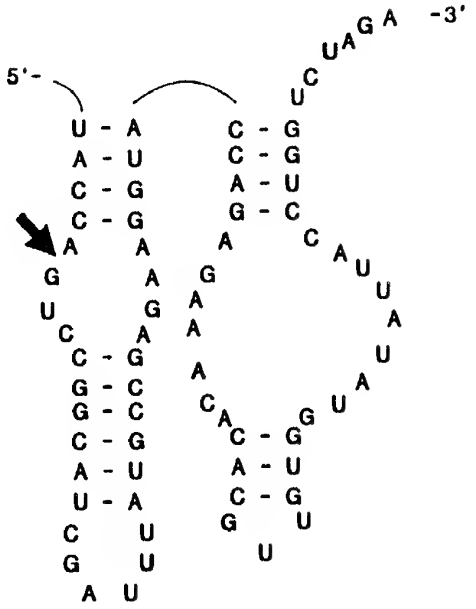
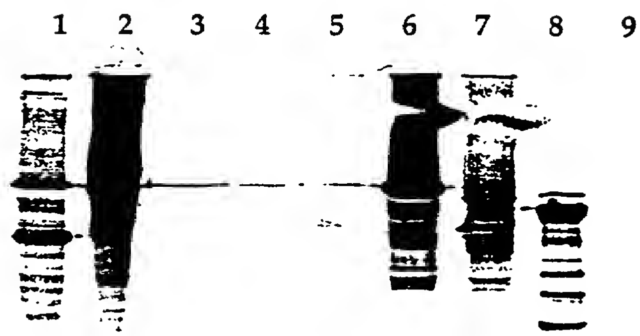


FIG. 10

FIG. 11

WESTERN BLOTS OF HaSV CAPSID PROTEIN

A. HaSV ANTISERUM



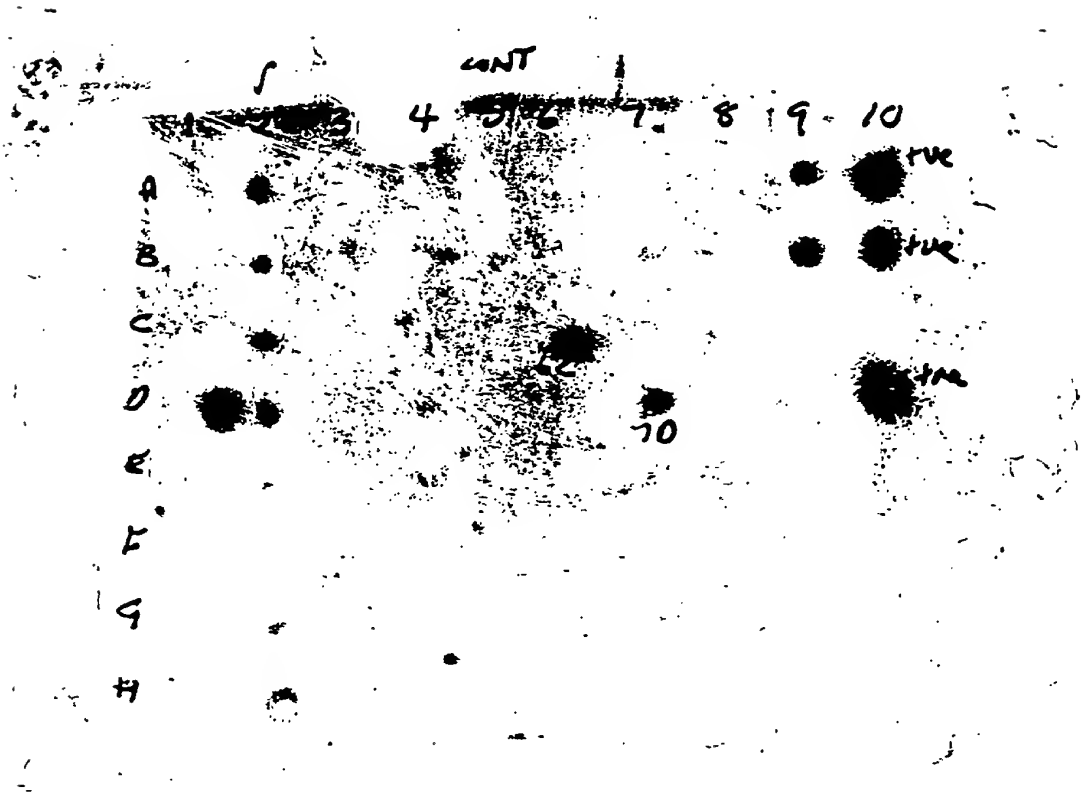
B HaSV ANTISERUM

C. Bt ANTISERUM

Bt toxin a/s

FIG. 12

DOT-BLOT DETECTION OF HaSV IN FIELD-COLLECTED HELICOVERPA LARVAE



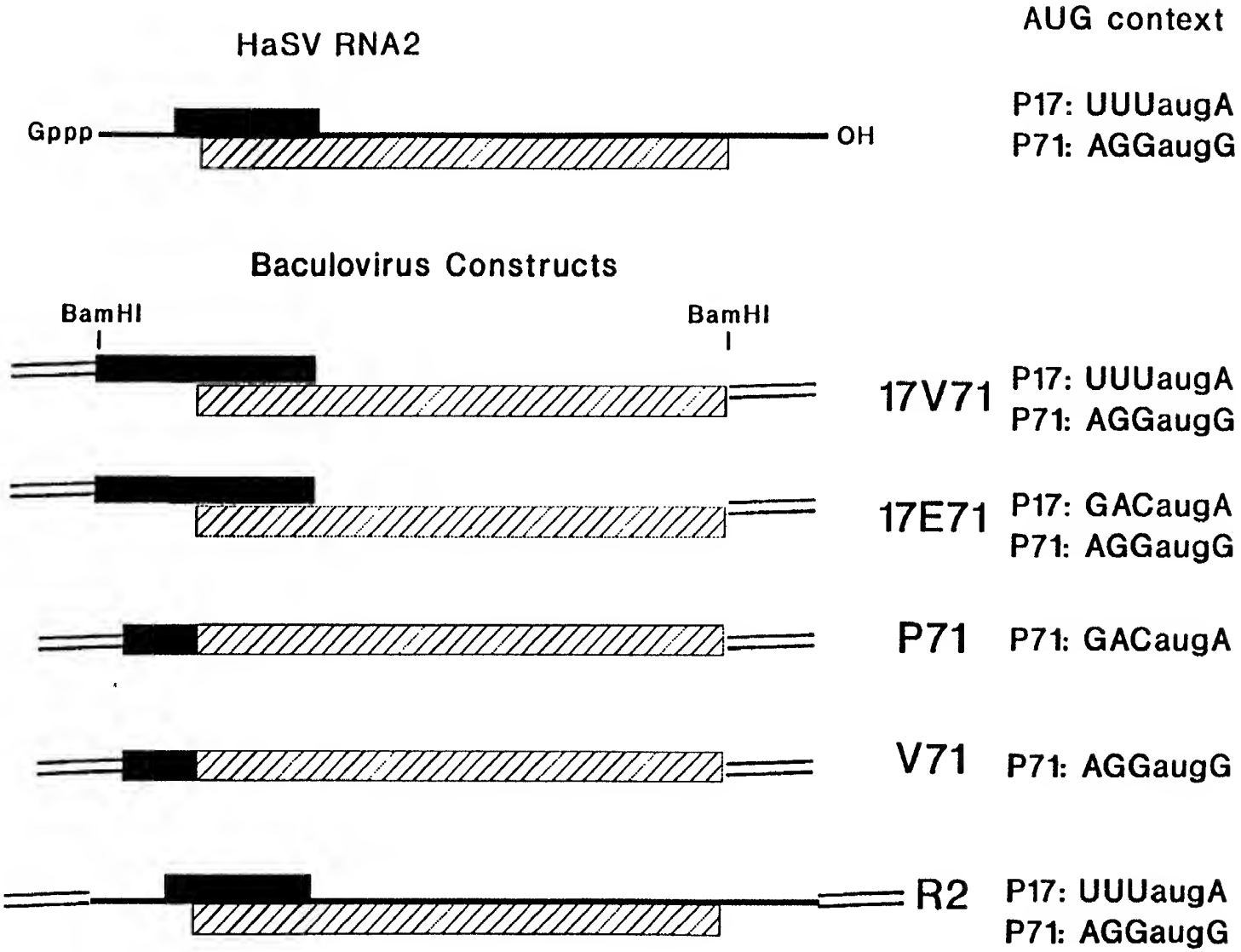
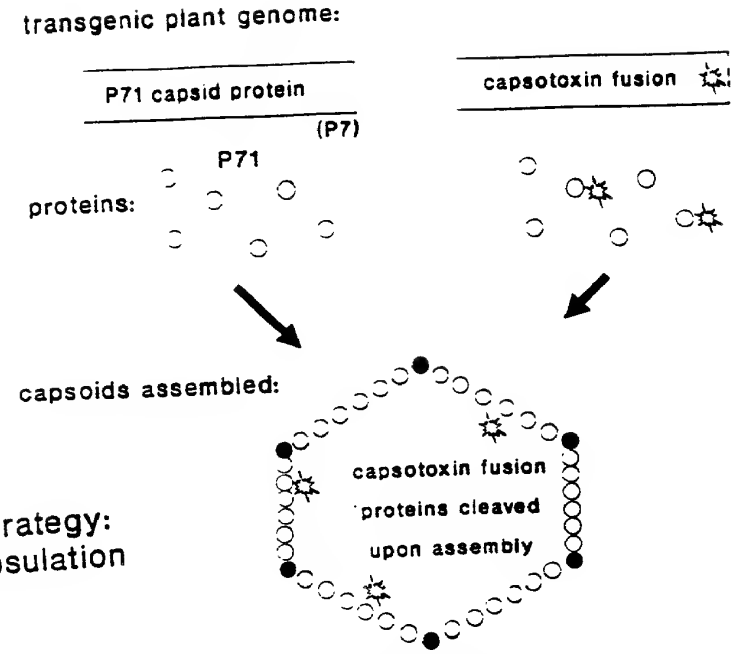
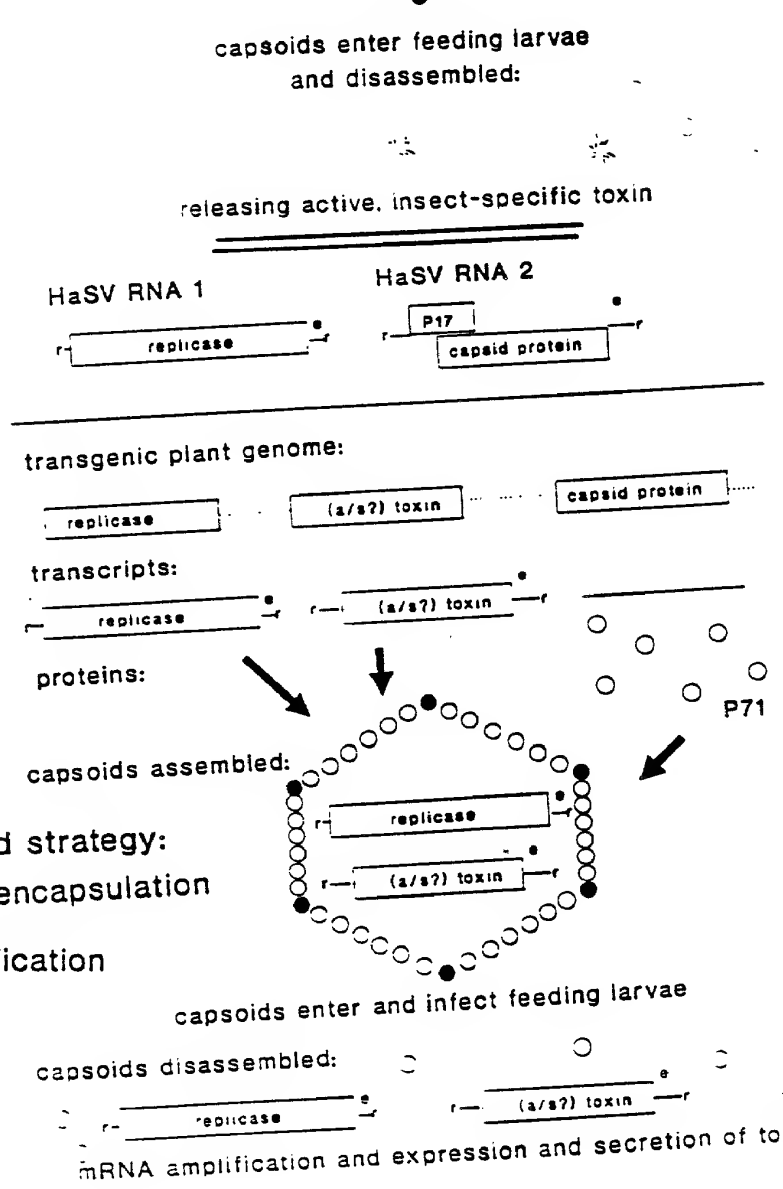


Fig. 13



Virus capsoid strategy:
capsotoxin encapsulation

FIG. 14a



Virus capsoid strategy:
toxin message encapsulation
and amplification

FIG. 14b

FIG. 14c

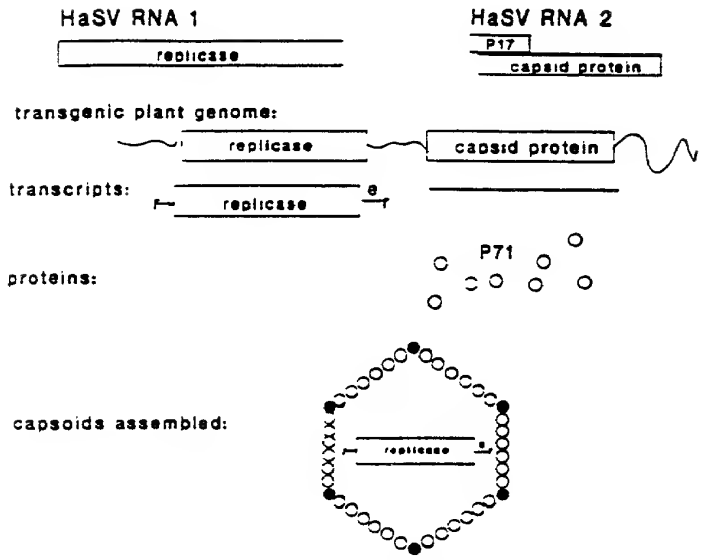
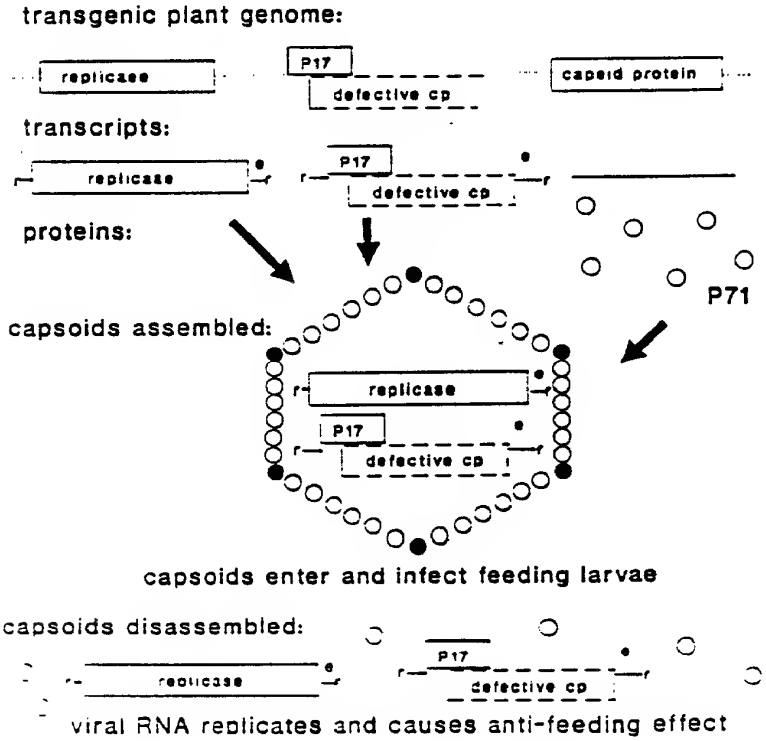
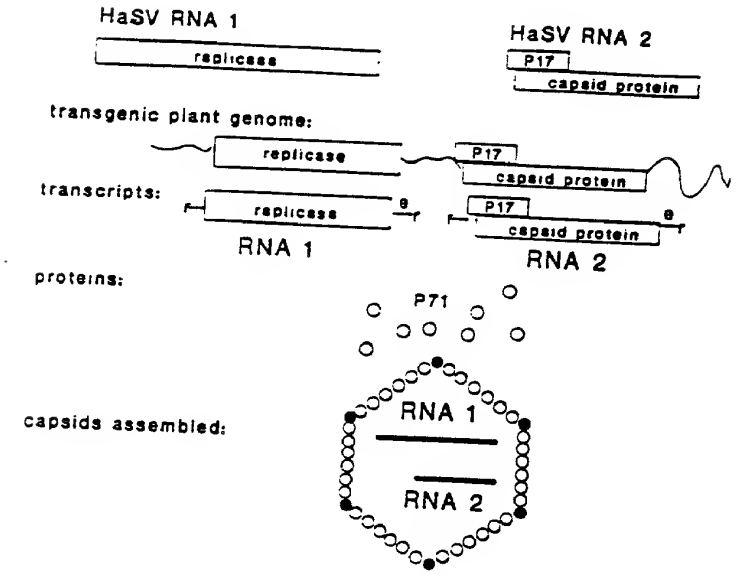


FIG. 14d



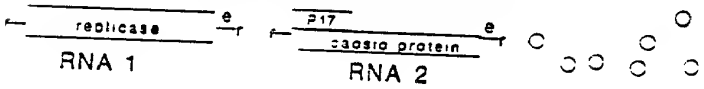
Virus expression in plants:

FIG. 14e



capsids enter and infect feeding larvae

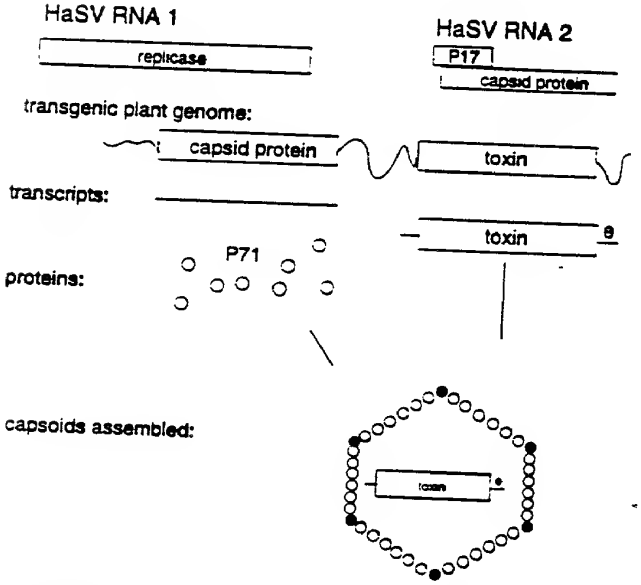
capsids disassembled:



virus replicates and causes anti-feeding effect

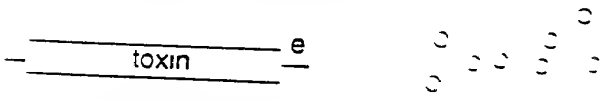
Virus expression in plants: the one-way vector for a toxin

FIG. 14f



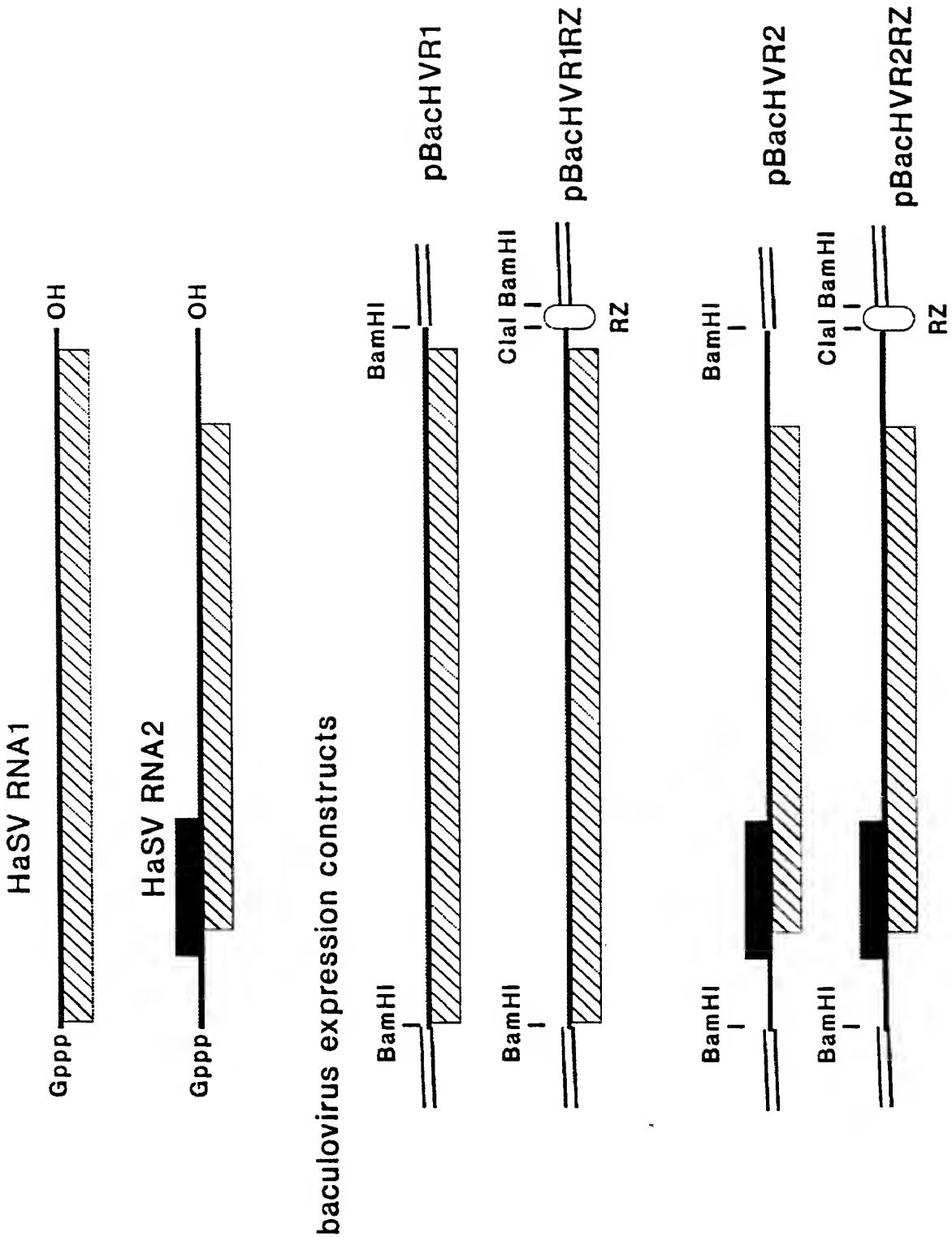
capsoids enter and infect feeding larvae

capsoids disassembled:



toxin expressed and causes larvae to cease feeding

Fig. 15


HaSV RNA1
Gppp
OH
HaSV RNA2
Gppp
OH
baculovirus expression constructs
pBacHVR1
BamHI
BamHI
pBacHVR1RZ
ClaI BamHI
RZ
BamHI
pBacHVR2
BamHI
BamHI
pBacHVR2RZ
ClaI BamHI
RZ
BamHI

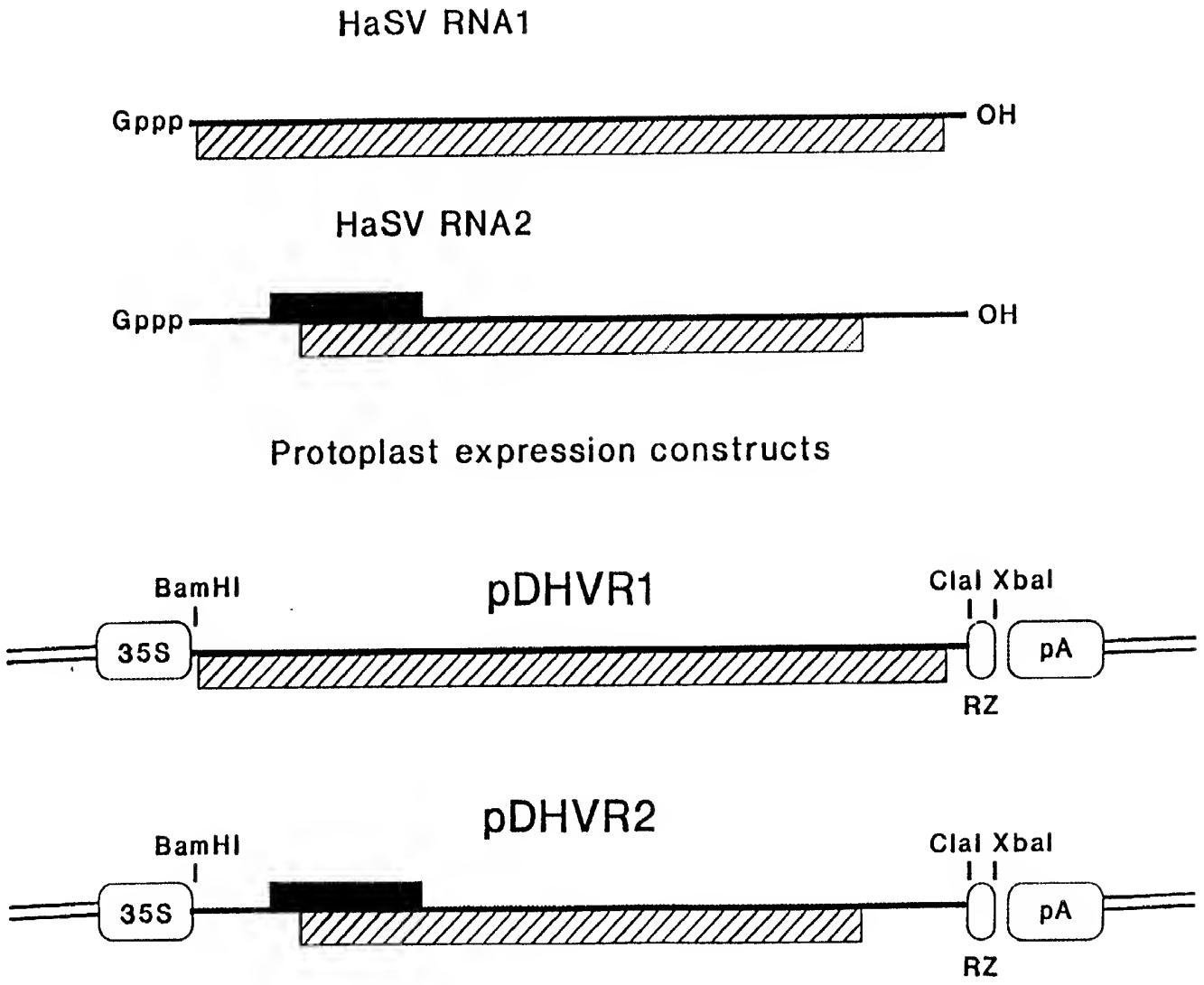


Fig. 16